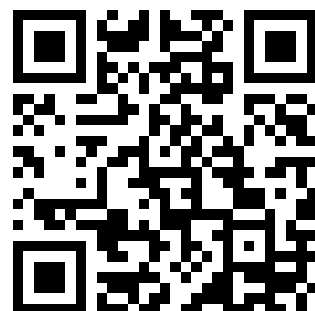


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# THE IRON AGE

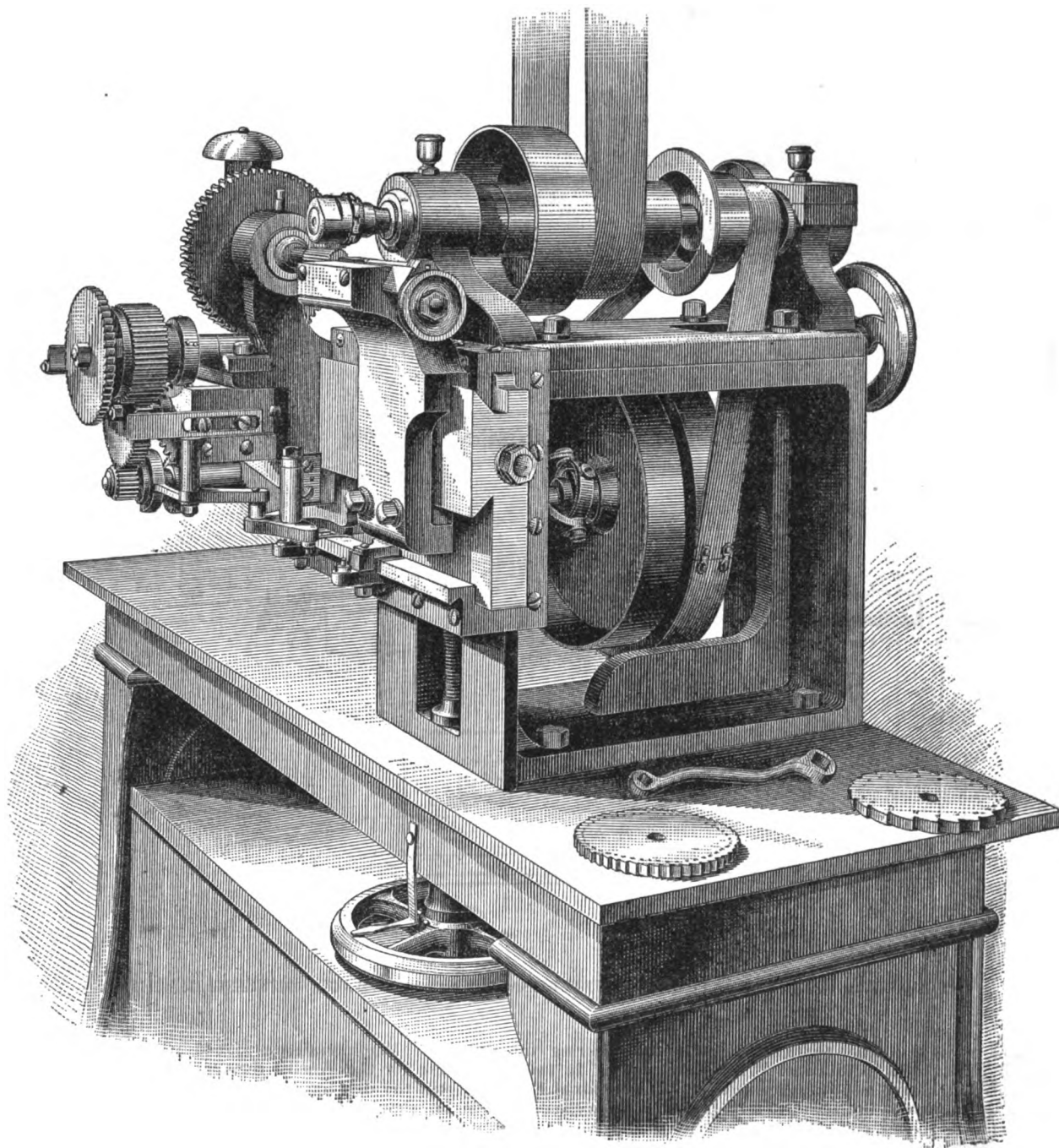
THURSDAY, APRIL 4, 1889.

## Universal and Automatic Milling Machine.

In those registering machines that employ a train of so-called clock-gearing to transmit motion from the driver to the hands of the dials it is most essential to have the gears run with as little friction

ting the gears and pinions used in that meter. It was necessary to have a machine the accuracy of whose work could be relied upon, and which would be rapid in operation and durable. An uninterrupted use of one of these machines for over seven years shows that it possesses these features in a marked degree. It has

has three changes of feed; the feed-cone B has two changes and drives the larger cone C. Motion is transmitted from the shaft of the cone C through a universal joint-connection, D, to the devices operating the table and dividing mechanism. On the shaft E is a clutch which engages alternately with a forward and backward



UNIVERSAL AND AUTOMATIC MILLING MACHINE.

as possible, and at the same time to fit so that lost motion will either be done away with entirely or reduced to a minimum. This is especially the case in those machines in which the power available for driving the mechanism is small. Recognizing these facts, the milling machine of which we herewith present a perspective and sectional drawing was designed by L. H. Nash, inventor of the Crown water-meter, solely for the purpose of cut-

cut at the rate of over 100,000 gears a year, and its repair account has been insignificant.

So self-explanatory are the drawings that a detailed description of the machine is not needed to enable one to understand its construction and operation; we will, therefore, merely mention the more prominent features. The driving shaft is provided at either end with a taper bearing for taking up wear. The driving-cone A

train of gearing, the speeds being in the ratio of  $4\frac{1}{2}$  to 1. The shaft immediately above and parallel with the shaft E performs two operations, one of which is the driving of the table through beveled gears actuating the table screw L, which can be disengaged from the gearing or brought into operation by a friction clutch shown at P, and of the form commonly used in the feed mechanism of a lathe. The second operation performed by the intermediate

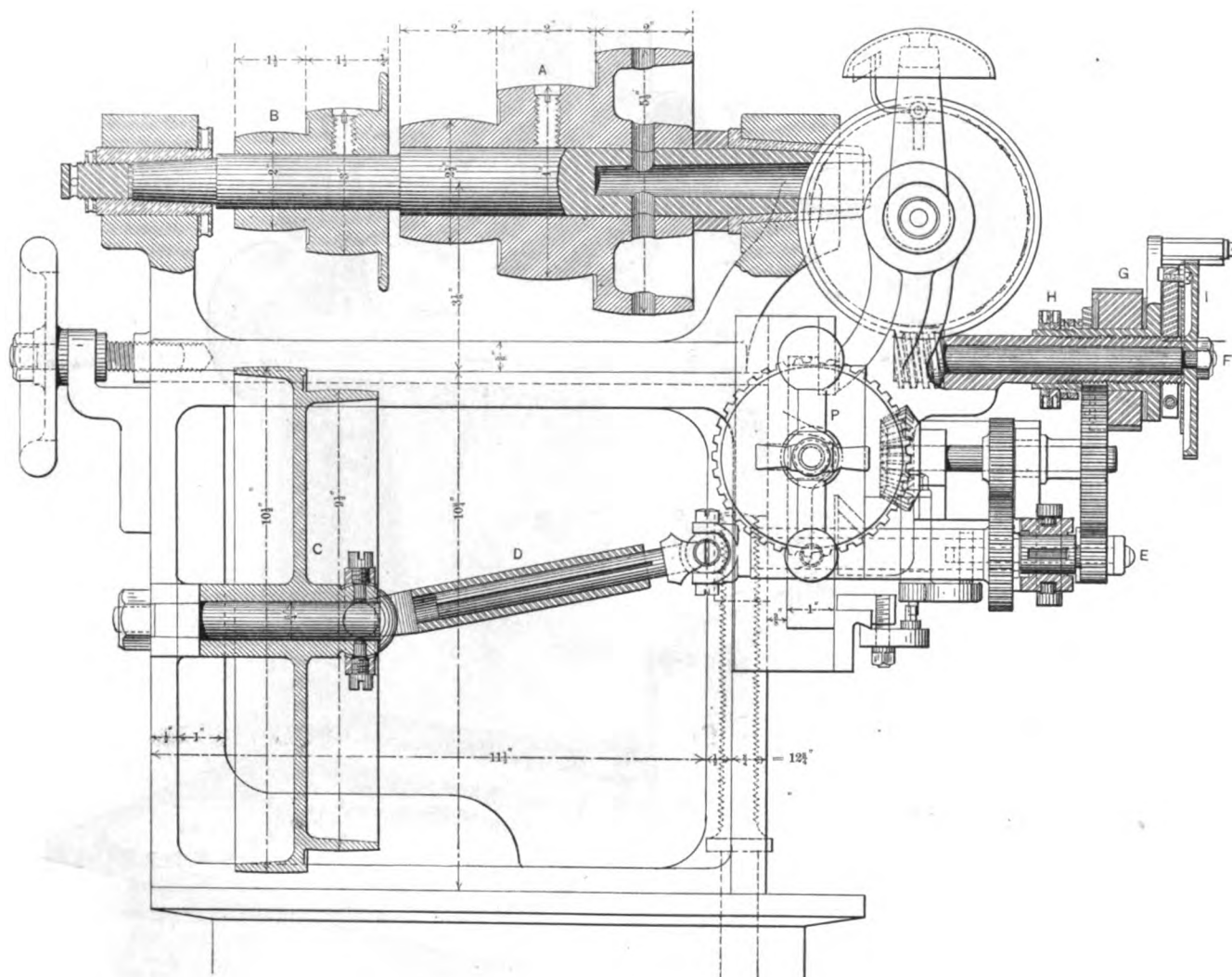
shaft consists in driving the automatic dividing mechanism carried by the shaft F, which is driven in either direction by the gear G, which is mounted loosely upon a sleeve, and is provided at each side with a leather friction clutch. On the sleeve is an arm, carrying a pawl, adapted to engage with the ratchet-wheel I, mounted on the shaft F, which has its bearing in a hollow shaft, and is formed with a worm at its inner end. The sleeve above mentioned has a threaded bearing, so that at each revolution it advances or recedes the space of one thread. The movement of the sleeve and its pawl-carrying arm is controlled by two stops, one of which regulates the number of complete

tember next. The opening day will be September 4, at 8 p.m., and closing day on October 19, at 11 p.m. The programme of opening exercises is given in full, together with the rules and regulations to be observed in all of the departments.

#### The Coke Trade.

A recent trip through a portion of the Connellsville coke regions by a representative of *The Iron Age* disclosed the fact that the condition of this industry at the present time is very unsatisfactory to the operators, both as regards orders received and prices obtained. While it is true that

ators in the region have stated that they are unable to meet present low prices and make any money, and have closed down their works as a consequence. A reduction in the wages of the coke-workers has been broached, and in all probability will be made during this month. As is well known, the present scale of wages is based on coke at \$1.25 per ton, and the operators say that it is impossible to pay these wages when coke is selling at a considerable reduction on this figure. A few months ago the H. C. Frick Coke Company, which firm controls more ovens than any other in the region, signed a scale of wages for one year based on coke at \$1.35 per ton, with the provision that unless a similar



SECTIONAL SIDE ELEVATION OF UNIVERSAL AND AUTOMATIC MILLING MACHINE.

revolutions, while the other regulates the fractional parts of a revolution. This action controls the movement of the shaft F, whose worm moves the spindle carrying the blanks being cut. The index-plates or ratchet-wheels mounted on the shaft F correspond with the dividing wheel on the universal milling machine and control the arc through which the blocks are moved.

The apparatus for reversing the clutch and holding the blanks present points of decided novelty and great value. We are indebted for the privilege of publishing engravings of this machine, which was designed solely for private use, and which has not been patented, to the kind courtesy of Mr. Nash and to the National Meter Company, of this city.

The Pittsburgh Exhibition Society have issued their prospectus for the first annual exhibition, to be held in that city in Sep-

shipments during the month of March were slightly in excess of those for the previous month of February, still the demand at the present time is far short of the productive capacity of the region. This statement will be borne out when it is known that fully three-fourths of the ovens in the region are idle on Wednesday and Saturday of each week. Notwithstanding this attempt to curtail production, the amount of coke on hand awaiting shipment is constantly increasing, and unless an improved demand springs up in the near future a shut-down of a considerable number of ovens is inevitable. This condition of affairs has not been without its effect on prices. While the published price of coke to furnace operators has been given as \$1.25 per ton, sales have been made in Pittsburgh within the last few days for future delivery at \$1.10 per ton, and it is hinted that bottom prices have not yet been reached. A few small oper-

scale was signed by the other operators by April 1 the scale was to be revoked. This has not been done, and, as we have already stated, the other operators will very likely insist on a lower scale than the one now in force. As yet neither the H. C. Frick Coke Company nor their employees have made any move in the matter of preparing a new scale, and it is thought the balance of the operators are waiting to see what action will be taken by this concern.

The United States has issued these new regulations for marine boilers: Any boiler having been in use ten years or more shall at each annual inspection thereafter be drilled at points near the water-line and at the bottom of the shell of the boiler, or such other points as the local inspectors may direct, to determine the thickness of such material at those points, and the general conditions of such boiler or boilers at the time of such inspection, and

the thickness of such material shall be determined thereafter at each annual inspection, and the steam pressure allowed shall be governed by such ascertained thickness and general condition of the boiler.

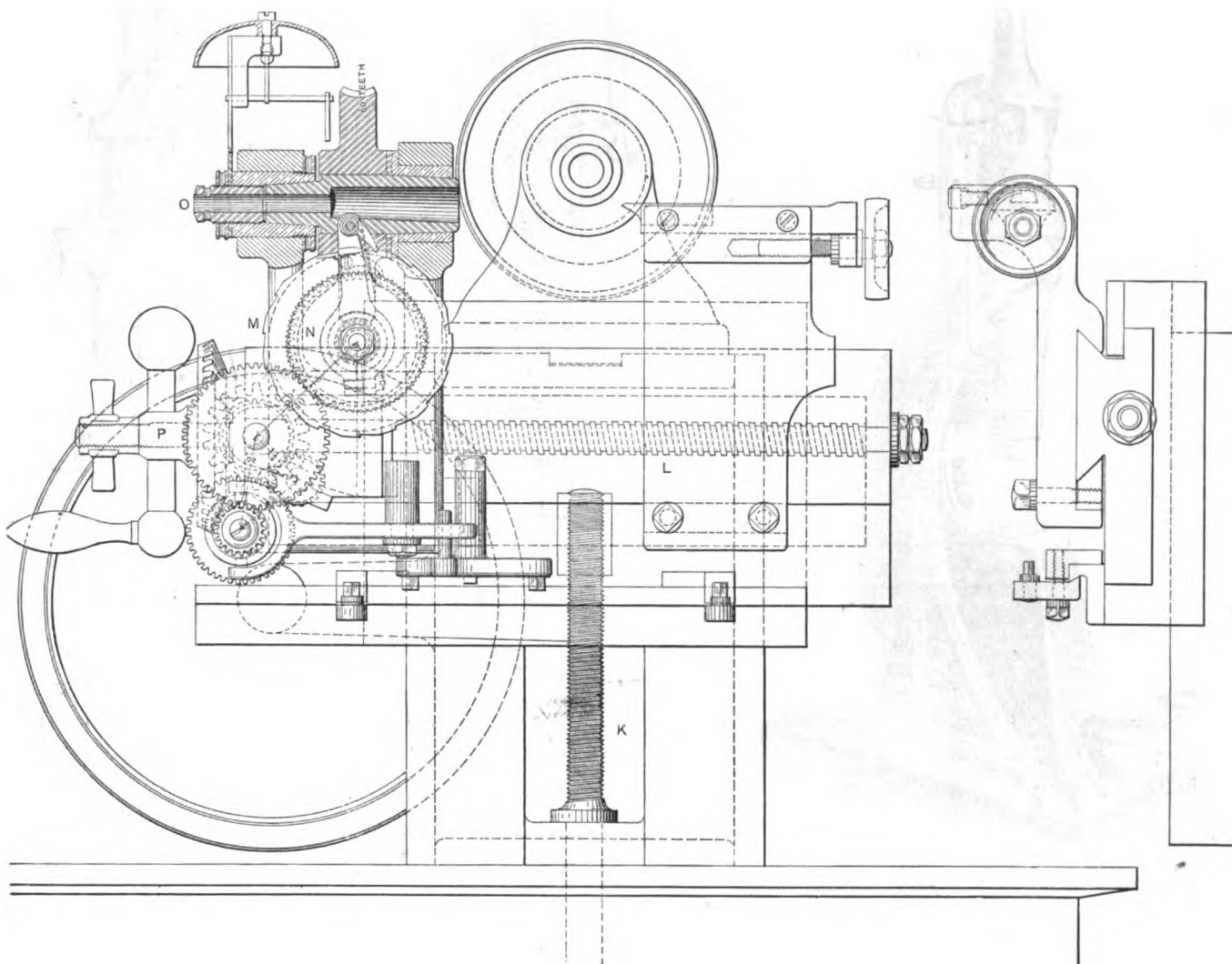
#### Grouped Rates.

The Interstate Commerce Commission, in an opinion by Commissioner Schoonmaker, has decided the case of the Imperial Coal Company and others against the Pittsburgh and Lake Erie and another. The points are as follows: The rate on transportation of coal to points on Lake Erie has been grouped since April 1, 1887,

in reaching a common market among themselves and with competitors from another territory, is not unlawful unless it results in actual undue prejudice to producers nearest the market. The question of undue prejudice is one of fact to be determined upon all the evidence, including the character of the mines, the quality of the coal, the expense of reduction, the extent and nature of the competition, the public interests arising from the use of the commodity, and not merely by the fact of distance. On the facts of this case, which involves only the question of discrimination between the complainants' mines and the more distant mines in respect to lake shipments, it does not appear that the complainants are subjected to

very dangerous and requires the closest attention, and therefore the wages paid them are quite high. Besides this, the least neglect on their part is apt to cause the kinking of the rod, and when this happens the delay in its passage through the mill chills the metal and unfits it for use, necessitating the cutting of it into pieces for scrap.

Henry Roberts, of Pittsburgh, Pa., has patented, under date of November 6, 1888, a simple and effective method of diminishing the evil alluded to. We understand that it has been successfully introduced at a number of rod mills. It consists in placing over the inclined guide-floor an elevated horizontal platform or floor. The wire loop travels on the in-



FRONT ELEVATION OF UNIVERSAL AND AUTOMATIC MILLING MACHINE.

for a considerable district in Western Pennsylvania, of which Pittsburgh is the center. The district has a radius of 40 miles around Pittsburgh. The group rate on coal is 90 cents a ton from all the mines and by all the lines of railroad that carry to the lake. The coal from the Pittsburgh district is in competition at the lake with coal from the Hocking Valley district, in Ohio, where the coal rate is also grouped at 85 cents a ton. The complainants' mines are near the center of the Pittsburgh district, and some mines within the radius are nearer the lake and others are more distant, varying from a few miles to 43 miles. On complaint for unjust discrimination against the complainants and undue preference to the more distant mines, it is held that a group rate to put producers of coal of the same general character and of practically like cost of production in a given territory on a footing of equality

undue prejudice, or that the more distant mines are given an unreasonable preference by the uniform rate.

#### The Roberts Wire-Rod Mill Floor.

In rolling metal rods in a mill as now commonly practiced it is customary to employ a series of trains of rolls set in line with each other and to pass the metal back and forth between these rolls. As the metal is reduced in diameter and increased in length there is always difficulty in controlling it and preventing it from kinking, especially so when it is attempted to roll more than one rod at a time in a single mill. For this purpose it has been usual to employ boys, who stand with hooks opposite to the rolls and guide the elongating metal loop, with a view of preventing it from kinking or injuring the workmen. The work of these boys is

clined floor below, and this leaves the horizontal floor unobstructed for the ordinary operations of the mill, the workmen being enabled to walk thereon in comparative security. It also consists in providing the floor of the mill with a projection or stop having a curved end, over which the metal loop passes and around which it is drawn by the action of the rolls. The effect of this projection is to straighten the metal rod and to remove from it kinks or bends, and to compel the rod to travel in a regular course from one pair of rolls to the next.

The 30th of April is a legal holiday throughout the Union in accordance with the last section of an act approved March 2, 1889, to commemorate the centennial observance of the inauguration of the first President of the United States, George Washington.

### The Tangye Gas Hammer.

It is claimed that with this hammer over 2500 of the heaviest blows can be given with the consumption of four cents' worth of gas at \$1.25 per 1000 feet, each blow being equal to that which would be given by a weight of 335 pounds falling one foot, and that it can be repeated at the rate of 120 blows per minute. Fig. 1 of the engravings is a perspective view showing the hammer fitted with a treadle to be operated by the foot; in Fig. 2 it is operated by hand; Fig. 3 is a rear view of the hammer.

The charging piston A is shown in its highest position near the top of the

the gases to pass through them, thus equalizing the pressure upon both sides of the piston. After the delivery of the blow the charging piston is forced down by the lever X, and as soon as it has descended far enough to uncover the exhaust port R the gases escape through the valves I I and the exhaust port R, until the pressure is reduced to that of the atmosphere. The same movement allows the igniter bolt to shut off communication with the flame. As soon as the pressure is sufficiently reduced, the volute springs G raise the piston D and the hammer in the position shown, this upward movement being arrested by buffer springs and leather collars at Y. Now, the downward

which it is desired to deliver, precisely like the hand lever commonly used in steam hammers for controlling the slide valve; the similar movement produces precisely similar results and the effort required to move it is no greater. A boy can work the gas hammer just as easily as a steam hammer. In cases where it is desired to strike very light blows, a relief valve is provided, which allows part of the pressure to escape; this valve being operated by the lever L in the hand machine, or in the treadle machine it may be operated at will, by the same motion of the foot which works the hammer. This is accomplished by fixing the plates for the foot at the ends of a cross bar, which is

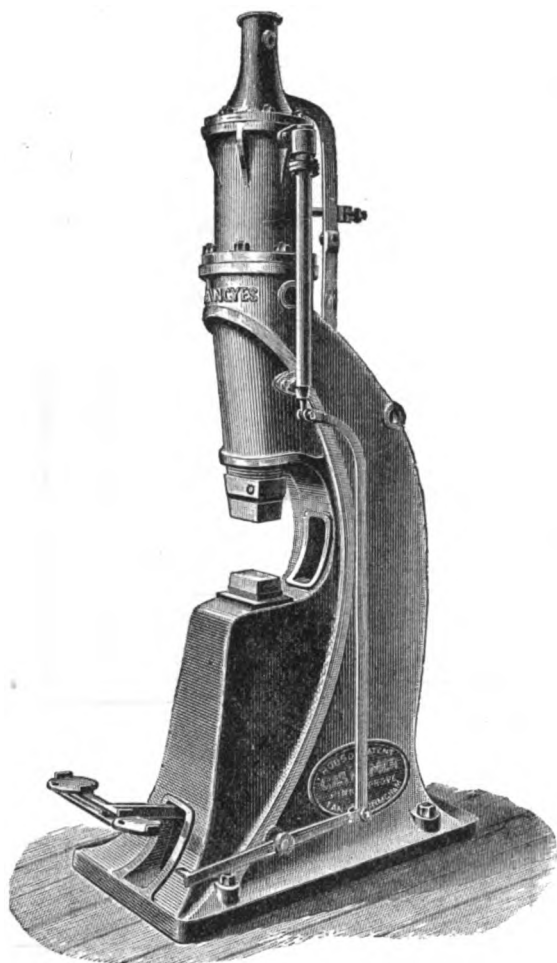


Fig. 1

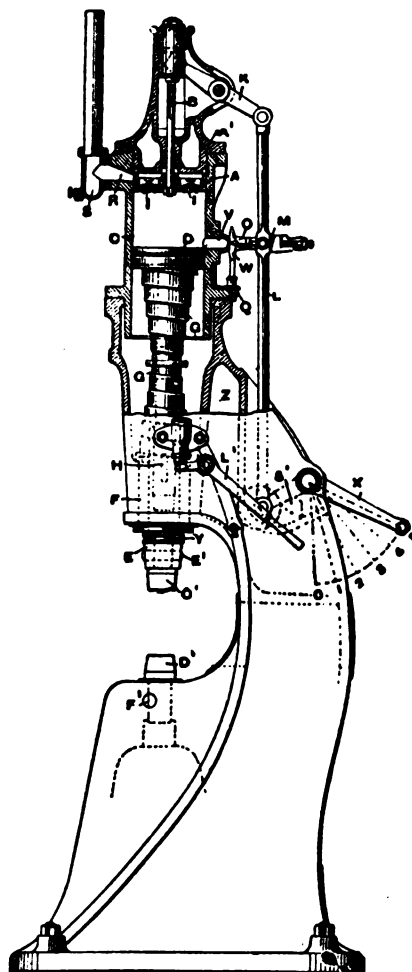


Fig. 2.

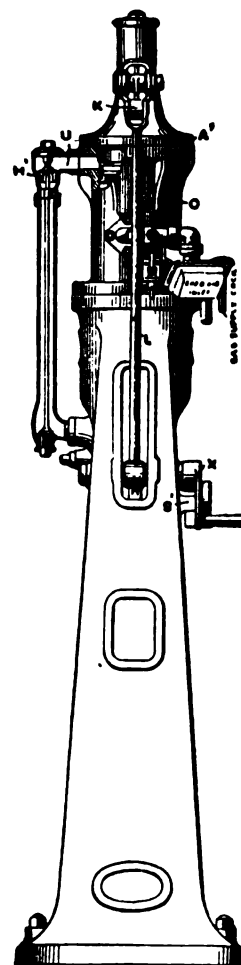


Fig. 3.

TANGYE GAS HAMMER, Mccoy & SANDERS, AGENTS.

cylinder, and between this and the main piston D the explosive mixture is drawn in and ignited. In operating the hammer the hand lever X is moved from the position 0 to position 5; this motion is, by means of the rod L and the lever K, transferred to the charging piston A, raising it to its highest position. This charging piston in its upward movement expels all gases above it by means of the exhaust passage R, until, when its highest position is reached, this part is covered by the piston. The same movement draws in between the pistons the mixture of gas and air ready for an explosion, and at the proper time a roller on the rod L lifts the igniter bolt, uncovering a Bunsen flame and firing the charge. The force of the explosion and the continued expansion of the gases drive the piston D downward until the blow is delivered. The force of the explosion does come against the charging piston A, because in it there are two valves I I opening upward, which allow

motion of the charging piston being continued until it is near the piston D, it is again raised to the position shown, and another blow delivered. This describes the operation of obtaining blows of maximum force at the rate of 120 per minute.

Now, it is evident that the charging piston with its valves I I is identically the same in its action as the plunger of an ordinary lifting pump, and that if it is brought down by the movement of the lever X quite close to the piston D, and then raised to its highest point, the space between the pistons will be filled with the explosive mixture; but if it be made to descend only part way and then raised, only as much of the explosive will be drawn in as is equal in volume to the displacement of this shorter stroke, and the force of the blow is therefore proportionally reduced. Thus, for producing heavy blows the hand lever X is always raised to position 5, but is depressed to position 4, 3 or 2, according to the force of the blow

swiveled to the lever in such a way that it may be swung around by the foot, so that in its descent it comes in contact with the relief-valve lever, shown at the side of the machine, Fig. 1. The piston D is forged solid with the piston-rod.

The employment of a gaseous explosion for the development of power has, by the increasing use of gas engines, been made familiar to mechanics, but this machine embodies a comparatively new application of the principle. In general appearance and in the method of handling this gas hammer is much the same as the steam hammer, and was originally designed to be used in places where steam was not easily available. This hammer is ready for work at any moment, and it will work as economically for a few minutes as when in sustained operation. Compared with power hammers driven by belt from the very best type of gas engines, it is claimed that this hammer is superior in point of economy, for while forging it uses very



much less gas than the engine, and none whatever while standing; whereas the gas engine must be kept running continuously, although the power-hammer driven by it is only being worked intermittently.

The hammer weighs 2700 pounds and will forge shafts 2 inches in diameter. The extreme dimensions are: Floor space, 3 x 2 feet; height over all, 7½ feet. It is stated that for the past 12 months one of these hammers has been almost continuously employed in the regular work of the smith, doing the very hardest kind of work, which it has done thoroughly well. The sole agents for this hammer in the United States are McCoy & Sanders, of 26 Warren street, New York.

### The New Torpedo-Boat.

The work on the new torpedo-boat for the navy is fast nearing completion, and the Herreshoffs expect to have it ready for trial during the coming May. Its hull is all in place, and the turtle-back-shaped deck is finished except the fitting of a few more steel plates. The starboard engine is practically finished, and as it stands erected in the shops of the company it is a handsome specimen of workmanship. Alongside of it is the port engine in process of erection. This engine is about half finished. Both engines will be erected in the torpedo-vessel before the latter is launched. When this event takes place, only a few days will be required by the Herreshoffs to get the boat ready for the speed test. The shafts have not yet arrived from the Midvale works neither are the two screws on hand. The Herreshoffs say that they are not to make the torpedo tubes. The probability is that these will be fitted to the vessel after she goes into commission at one of the navy yards.

The United States Government demands that this vessel shall make 20 knots an hour on the official trial. At the same time that the contract was signed the Herreshoffs estimated the boat's speed for the trial run at 23 knots an hour. Knowing, as naval officers do, how careful these contractors are not to give out too great hopes, it is confidently believed that this new torpedo-boat will prove as great a wonder as did the Vesuvius. The design for the vessel originated, in a crude form, with the Navy Department, the contractors having left to them the development of much of the detail, though all ideas and newly-conceived plans on the part of the latter have had to be submitted to and approved first by the department before they were authorized.

The new torpedo-boat is 137 feet in length, has a beam of 14 feet and 6 inches, and a depth of hold of 8 feet. Its draft will be 3 feet and 7 inches. As it will lie in the water it will present only 3 feet of freeboard along its whole hull, save at the forward part, where the whale-back deck will have a rise of some 5 feet from the water's edge. The length of this whale-back deck, which runs from the stem aft, cannot be over 20 feet. Just at its break is erected the forward conning tower, which will project above the whale-back. It will be a wet place when the torpedo-boat is driving full speed into seaway. The chances are that the long, low craft will go right through the seas like a swordfish, without waiting to mount the waves. Under the whale-back will be mounted the torpedo tubes, two in number, their forward ends projecting through each bow a few feet forward of its "bluff" on each side. The tubes will of course be loaded with the torpedoes at the breech, the working being down right at the conning tower. The magazine is under the whale-back deck, and will contain three torpedo stores. The after conning tower sets up about one-third the

length of the vessel from the stem, the communication with the forward one having to be made by running over the top of the turtle-back main deck. Two life-lines will be set fore and aft, leaving just space enough between them to permit of one passing and holding on.

The boilers for the vessel are to be mounted fore and aft. There will be two boilers, and consequently two engine-rooms, each boiler having three furnaces. The engines will be directly opposite each other, and it goes without saying that it will be little else than a squeeze in passing between them. The weight of the machinery is specified not to exceed 47 tons, and the displacement of the vessel with all her machinery, armament, boilers, water in boilers, and coal in bunkers, crew and stores, must not exceed 99 tons. When it is taken into consideration that the average horse-power ascribed to a vessel is two per ton of displacement, and that only three and four are given where great speed is demanded, the horse-power of the engines for the torpedo-boat might readily be placed at 300 or 400; but the Herreshoffs are actually giving 1500 horse-power to this frail, light craft. The boat's speed must certainly be tremendous.

The engines of the torpedo-vessels have each five cylinders, measuring respectively 11½, 16, 22½, 22½, 22½ inches in diameter. The shafts are 5½ inches in diameter. They are of solid steel, and are the work of the Midvale works of Philadelphia. The coal capacity of the little vessel will be about 25 tons, according to Mr. J. B. Herreshoff. There will be little chance to wedge in an extra ton or so. But, then, as the torpedo-boat will be wanted for coast service it need give little concern to the question of how far she can run without recoaling.

The contract price to be paid by the Government for the new torpedo-boat is \$82,750, the requirements being that she show on trial a speed of 20 knots an hour. The coming July ought to see her on the active list and in commission. She is to carry a secondary battery of two 6-pounder rapid-fire guns, presumably to be mounted somewhere on her turtle back. The only vessels the little craft can expect a hostile attack from by way of a surprise will be from hostile torpedo-vessels or the enemy's small boats sent out to board her. Against such attacks Gatling guns would prove of little use except to clear the way of small boats. But against the sides of the attacking torpedo-vessels their fire would be futile. It is here that rapid-fire guns will play a prominent part and be the only means of saving the vessel. The same reasoning has been applied to the arming of the Vesuvius with a secondary battery as was in the case of the torpedo-vessel.

The best type of the Puget Sound saw-mill is unquestionably the big mill at Port Blakely, built within the last year. It contains two rotaries, two pony rotaries and two Wilkin gangs, all driven by four engines located under the sawing floor. The mill is 430 feet long, provided with live rolls, Hill niggers, rope feeds and Cunningham twin engines, hydraulic lifts, tracks for readily getting the lumber away by cars, automatic sprinklers and the best of fire protection. As in most of the mills, the planing machinery is located on the floor underneath the main sawing floor. As in all the mills, also, the circular saws are swaged so that they are a full half inch in thickness, and take out at every cut just that amount of saw-dust. According to computation a fraction more than one-fifth of all their raw material goes into saw-dust and shavings, and they daily burn in the open fire across the bay, where it is carried with the aid of a blower, fully 15 tons of saw-dust.

### Machined Car-Wheels.

Notwithstanding the improvements made in the manufacture of chilled wheels, there remains an apparent necessity for finishing them by some method of grinding. Even those made in the contracting chill are turned out with the tread covered with small ridges, which, while not seriously objectionable, must increase the resistance of the train and the abrasion of the rail. These objections have not been considered serious enough to warrant the expense of grinding the wheels by ordinary methods, but makers have considered and are considering now the possibility of introducing machinery that shall turn out wheels free from this defect. For wheels made in the non-contracting chill, the importance of grinding is much greater. They cannot approach so near to absolute roundness and perfect balance as do the wheels made by the more improved method. Some years ago machinery was introduced for truing the chilled wheel, but the work could not be done as economically or rapidly as was necessary to admit of such wheels coming into general use; besides, the wheels so trued were finished after having been pressed on the axles, and as few consumers buy in this manner, the use of such wheels did not become general.

The New York Car Wheel Works, of Buffalo, N. Y., have been engaged for the past two years in building machinery and fitting up a plant for doing the work necessary to turn out wheels perfect in the above respect. The wheels are first bored, then turned true on the tread and balanced. The machinery for doing this work is of entirely new design, and capable of rapid and economical working. One machine will turn out 40 finished wheels per day. This brings the use of wheels mechanically perfect within the possibilities for every kind of service. Of the great desirability of having wheels perfectly round and balanced there is no question. Cars will ride smoother and haul easier; the wear on the track and bridges will be less and the life of the wheels increased. The company are now manufacturing cast wheels in diameters 36-inch, 40-inch and 42-inch, the 36-inch weighing 750 pounds, the 40-inch, 850 pounds, and the 42-inch, 900 pounds. The use of cast-iron wheels of large diameters has not been looked upon favorably heretofore, doubtless because they could not be made mechanically perfect. If these large diameters can be turned out as accurate in form as steel tires and as cheap as good ordinary chilled steel wheels their use will probably extend. The wheels made by the New York Car Wheel Works are designated as "machined" car-wheels, and a guarantee is given that all wheels sold will be true to ¼ inch and balanced to an average of 2½ pounds; no wheel to exceed 5 pounds, out of balance. The same company furnish brake shoes, truing them on the face, so that perfect contact is secured when the brakes are applied, and the wear of the shoes having been commenced in a proper manner, continues in the same way until they are worn out.

Provisional returns of the mineral production of France in 1888 fix the output of coal, including anthracite and lignite, at 22,954,940 tons, an increase of 1,664,351 tons on 1887. The production of pig iron rose from 1,806,930 tons to 1,688,976 tons; of wrought iron, from 771,610 tons to 833,839 tons, including 598 tons of iron rails in 1887, and 538 tons in 1889. Steel increased from 493,294 tons to 535,646 tons. There was a decrease of 27,311 tons in steel rails compared with 1887, but an increase of 46,568 tons in merchant steel, and of 13,095 tons in plates.

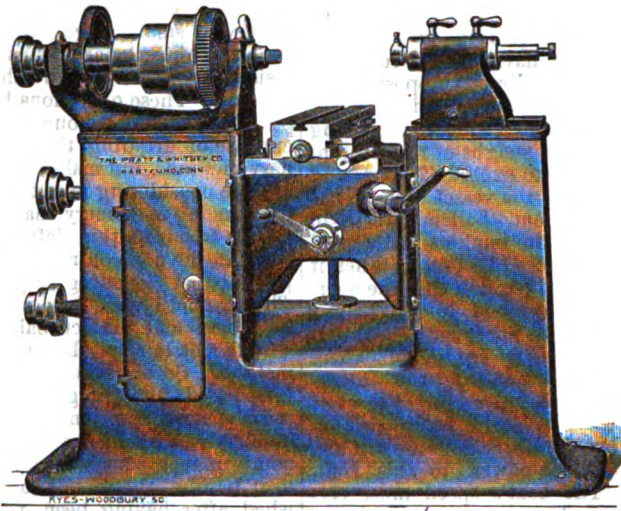


**Double-Column Milling Machine.**

There are few machines in which rigidity plays so important a part as in the milling machine. The nearer it approaches to absolute firmness the more accurate will

file, ground and polish, and thus gradually lead up to the delicate operation of adjustment. A diploma will be granted after proficiency has been attained. There will be lectures, constant supervision and regular systematic instruction. Several

be converted as desired. It is stated that the company are at present making hatchets, axes, adzes, hoes, shears, &c. The company contemplate building another factory this year, and will also manufacture in Canada to save the patent there. The tests will be complete in several weeks.



THE GRANT DOUBLE-COLUMN MILLING MACHINE.

be the work done by it. The accompanying engraving illustrates a machine in which this feature is carefully considered, and in which a degree of stiffness has been obtained far beyond the usual construction. The machine was designed by John J. Grant and is manufactured by the Pratt & Whitney Company, of Hartford, Conn. Cast solid with the base are two columns, on the inner faces of which sliding surfaces are formed, and to both of which the elevating block is fitted and to which it may be clamped when in use. The inherent stiffness of the columns is thus increased, since they are rigidly clamped together as near the top as the height of the work will allow. The machine is simple in construction and all its movements are effected by handles placed within convenient reach. The vertical and horizontal adjustments of the table can be minutely varied by means of graduations to the thousandths of an inch. The machine is geared in the ratio of 9 to 1. The largest step of the cone is  $10\frac{1}{2}$  inches in diameter, the belt being  $2\frac{1}{2}$  inches. The front bearing of the headstock spindle is 3 inches in diameter and 5 inches long, the thread on the end being  $2\frac{1}{2}$  inches in diameter. The greatest distance between the head and tail stock spindles is 16 inches, and between the top of the table, when lowered, and the center of the spindle,  $12\frac{1}{2}$  inches. The travel of the table is 16 inches; width of saddle,  $18\frac{1}{2}$  inches; horizontal adjustment on slide,  $7\frac{1}{2}$  inches. The machine has 12 changes of feed, eight speed changes and automatic screw feed with stop-motion. The weight of the machine is 2000 pounds.

The latest industrial venture established in Pittsburgh is a school for watch making, which has just been opened in that city under the direction of L. L. Keller. The school contains ten desks, fully equipped with the requirements of the trade. Cabinets, heaters for drying watches and adjusters for heat, cold, isochronism and position are all in readiness. In an interview regarding his venture, Mr. Keller states that in his opinion Pittsburgh is large enough to support a horological school, and should have had one before this. There are but few horological schools in the country, the nearest one to that city being located in Chicago. He will first teach students how to handle tools, then how to

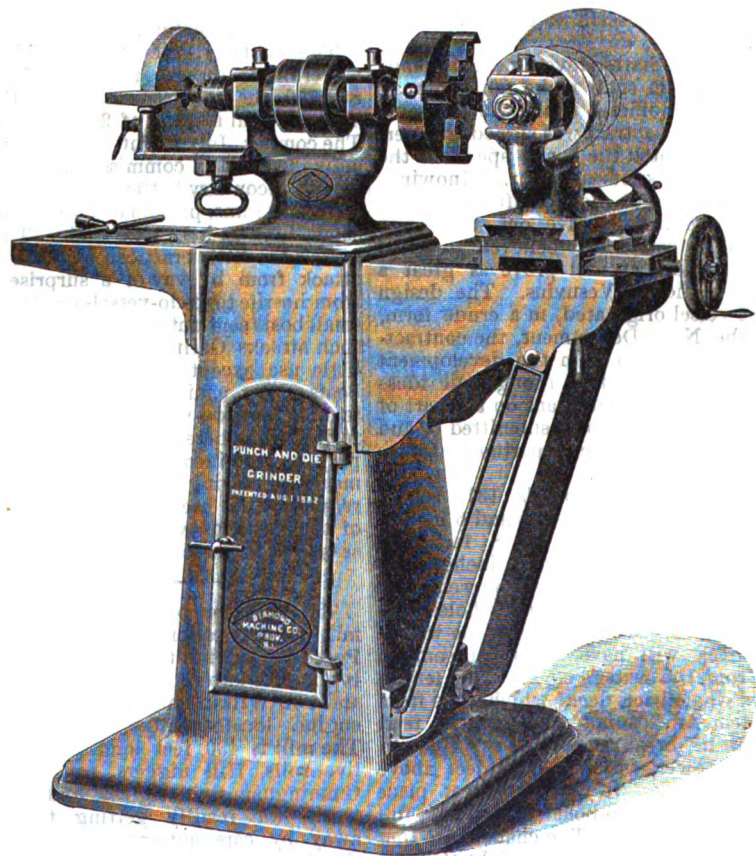
prominent gentlemen have expressed themselves as interested in the school.

A correspondent reports that the Falls City Malleable Iron and Steel Company, of

**Diamond Punch and Die Grinder.**

The machine herewith illustrated is one of the late improvements in grinding machinery brought out by the Diamond Machine Company, of Providence, R. I., and is designed for grinding and finishing punches and dies, or any hardened cylindrical surfaces; also for squaring and smoothing up any metal pieces having flat, concave, or convex surfaces to be finished, and which can be held in a chuck or on a face plate.

The machine has two spindles at right angles to each other, in the same horizontal plane; one carries the chuck and the other the cutting-wheel. The chuck spindle, which is  $1\frac{1}{2}$  inches in diameter in the boxes, and will carry a chuck up to 10 inches in diameter, runs in a head bolted rigidly to the column, and has a cone pulley for a  $2\frac{1}{2}$ -inch belt, giving two changes of speed. The emery-wheel spindle, which is  $1\frac{1}{4}$  inches in the boxes and 1 inch between flanges, and will take wheels up to 12 inches in diameter, runs in a head which has a horizontal movement of 3 inches and a lateral movement of  $4\frac{1}{2}$  inches, both of which are effected by hand. This spindle is also adjustable about a central pivot. The grinder is provided with a patent dust-excluding device, and is substantially built throughout. It weighs, complete



DIAMOND PUNCH AND DIE GRINDER.

Louisville, Ky., are making edged-tools by the Harper-Clark process. The process requires the casting of the tool in even thickness throughout and annealing it to a certain point. It is claimed that the process eliminates the cost of forging entirely and permits any part of the too to

with the countershaft, 850 pounds. The floor space occupied is 25 x 25 inches, and the height from floor to center of spindle is 41 inches. Further particulars can be obtained from the home office as above, or from the Chicago office, 51 South Canal street.



## Lathe and Planer Tools.

**Tool-Grinding Machine and Tools  
Used at the Works of William  
Sellers & Co.**

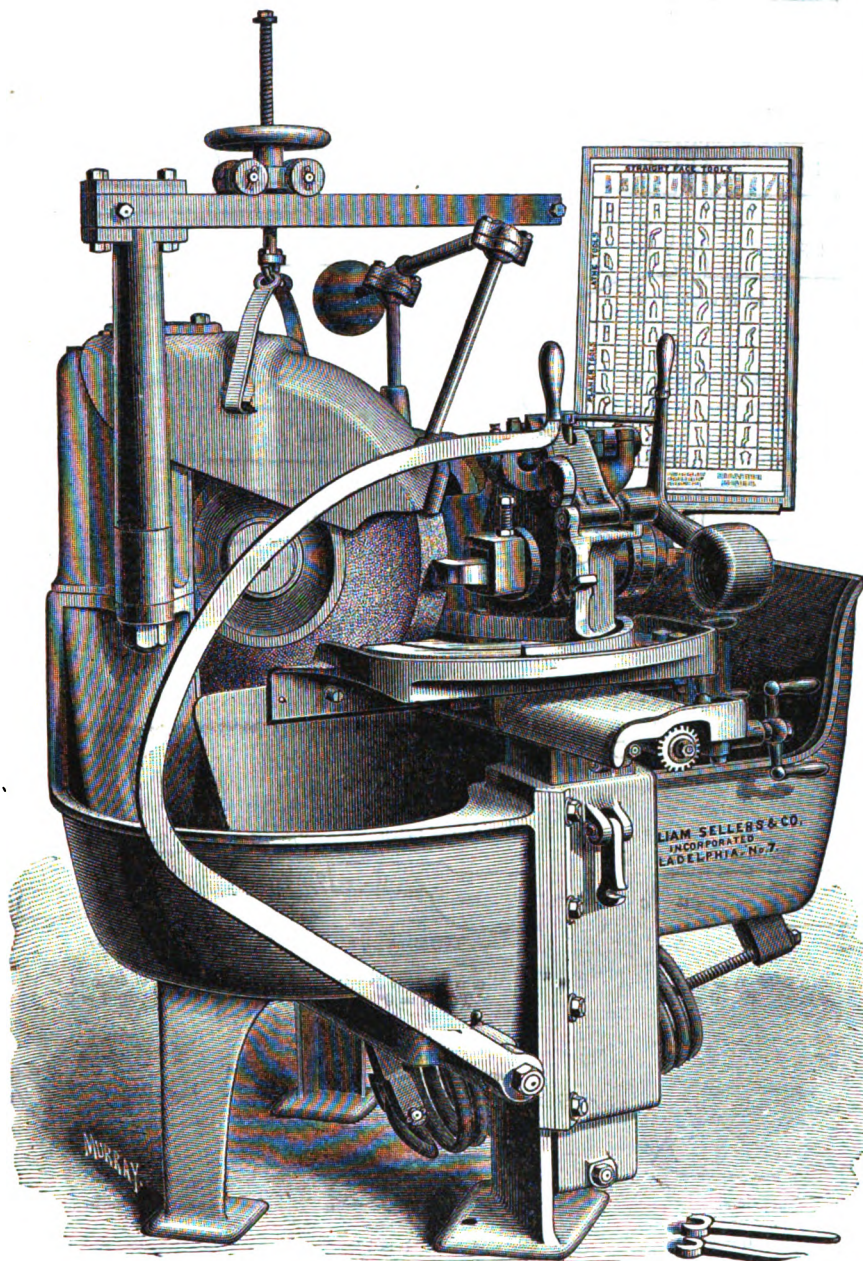
All the lathe and planer tools used at the works of William Sellers & Co., of Philadelphia, are made according to an extremely simple and effective system, which is really the interchangeable idea applied

he may need an unusual form. The tools made and kept in stock are of such diversified shapes as to apply to all regular jobs; but when a new form is imperatively needed the foreman is notified, a drawing is made showing its shape, and then it is forged and ground.

The grinding machine is intended for shaping and dressing hardened tools to the most complicated shapes, by means of a grinding wheel of peculiar form of face, acting in connection with chucks, slide-rests and former plates to hold and direct

iron cover. A rotary pump forces water to the tool being ground through a system of pipe, the nozzle of discharge being made to hold the same relation to the tool in motion as at rest. Slide-rests, adjustable in angle by means of graduated arcs and verniers, have vertical, horizontal and rotary motion, moving the tool in all directions in front of grinding-wheel so as to grind its several faces at one setting to any angle of clearance or top rake. The machine is furnished with former plates for grinding all the forms of roughing tools which have been found to be most useful at the Sellers works, and means are provided to enable new former plates to be originated from a sample tool made by hand. The machine is provided with a chuck for circular or round-nose tools, which is also used in connection with former plates furnished to grind curved-face roughing tools, right or left hand, and at any angle; a holder to be used in grinding the side or base of the shank of the tool; a chuck by means of which any bent tool can be ground on all its faces without changing its position in the chuck; a chuck to hold splining or key-seating tools in the same manner, and a crane for lifting the heavy wheel cover, changing the wheel on its spindle, or lifting the chucks.

Accompanying the machine are diagrams upon which are figured 56 different kinds of plain-face tools, showing all the angles and the position of the chuck that holds them; also nine different shapes of either right or left hand tools, covering seven sizes of each from  $\frac{1}{4}$  inch to 2 inches, indicating the former plate to be used in each case, and also a table of circular tools which the machine grinds perfectly without the use of former plates, and which embraces all sizes from  $\frac{1}{4}$  inch to  $2\frac{1}{2}$  inches



TOOL-GRINDING MACHINE, BUILT BY WILLIAM SELLERS & COMPANY.

to tools of this description, since all the tools of the same kind are alike in every essential characteristic. Tools in the rough are taken from the blacksmith shop to the patent tool-grinding machine built by the company, where each is ground in accordance with certain rules controlling its desired form. The finished tool then passes to the tool room, from which it is delivered to the men. This method insures uniformity of the tools themselves and tends most materially to enhance the quality of the work they do—when the latter is considered as a whole—and it also results in the saving of much time, as it is against the rule for a machinist to grind his own tools, no matter for what purpose

the motion of the tool while it is being shaped. All ordinary tools used in lathes, planers and all other machine tools, the cutting edges of which are bounded by planes, or planes and convexed-curved surfaces, are ground to shape from the rough forging with ease and dispatch, irrespective of the position the cutting edges stand in relation to the body of the tool. The grinding-wheel is of coarse structure, but from the direction of its cut it grinds both quickly and fine. It is mounted on a box frame, part of which serves as a tank to hold the water used in flooding the tool to keep it cool. This tool can be reversed face about on its spindle to equalize the wear, while it is inclosed in a massive cast-



Circular Tool.

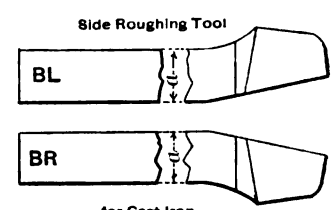
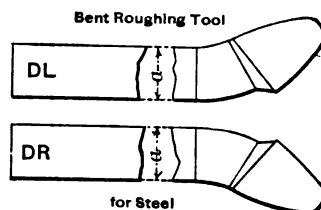
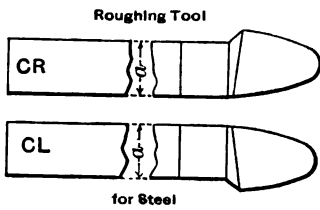
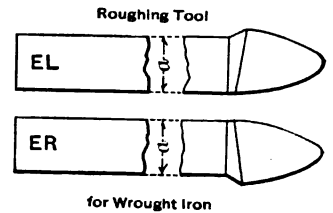
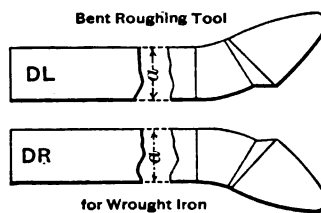
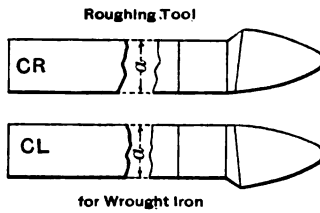
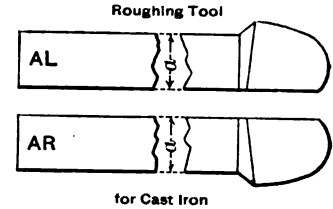
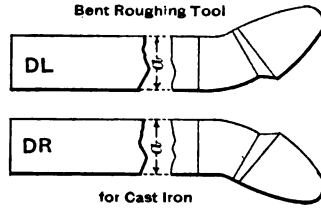
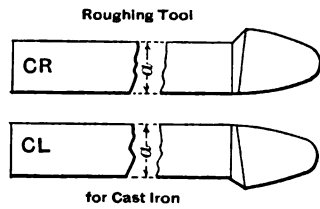
diameter of circle. These tools, of which we herewith present the outline and give the clearance angles, are those used in the Sellers shops, and they may be said to represent the outcome of years of experience and to be the best form of fixed tools to enable machine tools to work to the best advantage.

The diagrams give, in addition to a plan outline of the tool and angle of clearance of its sides, both of which we herewith reproduce, the horizontal angle on the grinding machine, and also the vertical angle. To illustrate, the diagram gives, in the case of the "finishing wrought-iron" lathe tool, a drawing of the tool, the angles of clearance of the sides  $a, b, c, d$  (both of which we reproduce), the horizontal angle on the grinding machine for each of the sides,  $a=90^\circ, b=90^\circ$ , and  $c=80^\circ$  and top  $d=110^\circ$ , and the vertical angle on the grinding machine,  $a=356^\circ, b=184^\circ$  and  $c=90^\circ$  and top  $d=95^\circ$ . These directions embody all that is needed to enable one to grind a tool to the required form. Directions are given for grinding circular tools having diameters of  $\frac{1}{4}$  to  $2\frac{1}{2}$  inches by sixteenths.

Witherbees, Sherman & Co., of Port Henry, N. Y., miners and shippers of Lake Champlain ores, announce that they have discontinued their Western sales agency, formerly conducted by M. A. Hanna & Co., of Cleveland, and ask that inquiries and orders be addressed to the main office at Port Henry, or the branch office at 46 Wall street. Their representative, G. B. Wilkinson, will visit Western consumers at an early date.

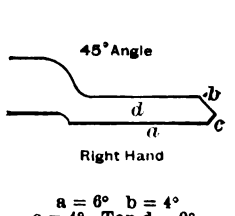
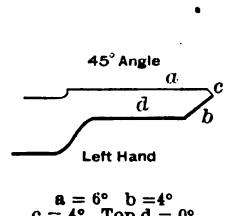
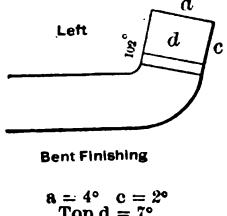
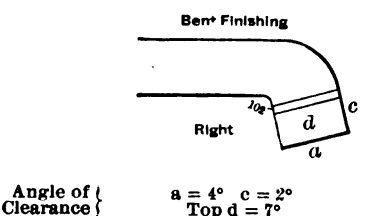
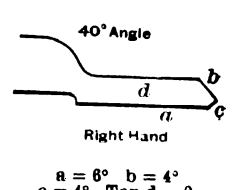
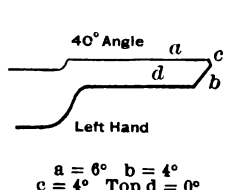
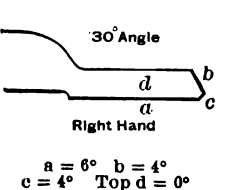
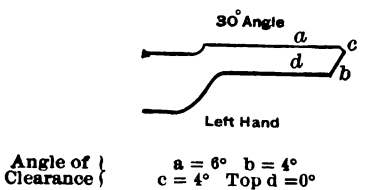
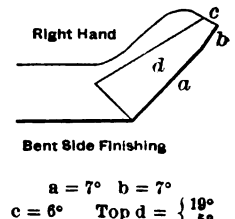
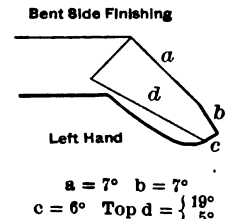
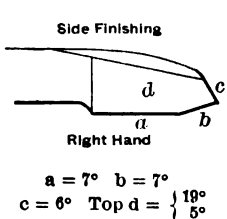
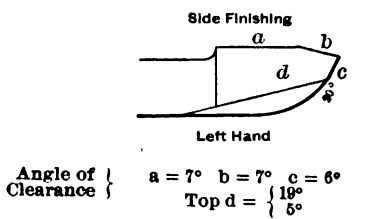
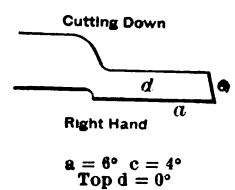
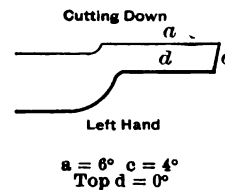
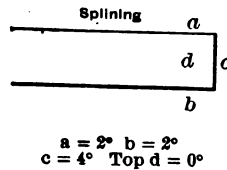
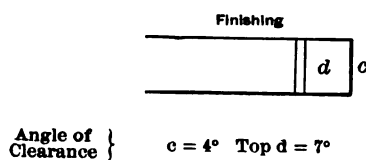


## CURVED-FACE TOOLS.

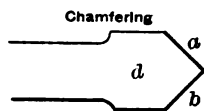
*Lathe.**Planer.*

The sizes (*a*) of all of the above tools are as follows :  $\frac{1}{2}$ ,  $\frac{3}{8}$ ,  $\frac{1}{4}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$ , 2 inches.

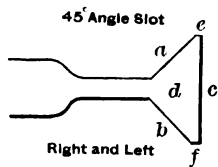
## PLANER TOOLS.



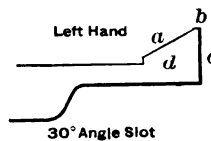
# PLANER TOOLS.



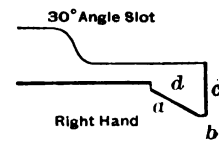
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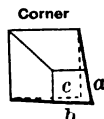
$a = 4^\circ$   $b = 4^\circ$   $e = 4^\circ$   
 $f = 4^\circ$   $c = 4^\circ$  Top  $d = 0^\circ$



$a = 4^\circ$   $b = 4^\circ$   
 $c = 4^\circ$  Top  $d = 0^\circ$

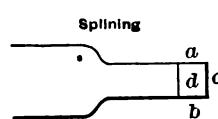


$a = 4^\circ$   $b = 4^\circ$   
 $c = 4^\circ$  Top  $d = 0^\circ$

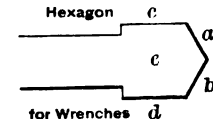


Angle of Clearance }  $b = 4^\circ$  Top  $d = 4^\circ$   
End  $c = 7^\circ$

$a = 4^\circ$   $b = 4^\circ$   
 $c = 0^\circ$  Top  $d = 4^\circ$   $e = 4^\circ$

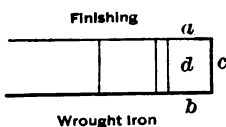


$a = 1^\circ$   $b = 1^\circ$   
 $c = 0^\circ$  Top  $d = 4^\circ$

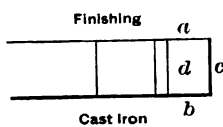


$a = 4^\circ$   $b = 4^\circ$   $c = 4^\circ$   
Top  $d = 4^\circ$  Top  $e = 0^\circ$

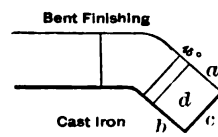
# LATHE TOOLS.



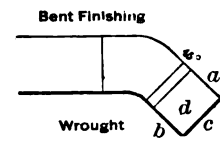
Angle of Clearance }  $a = 4^\circ$   $b = 4^\circ$   $c = 10^\circ$   
Top  $d = 20^\circ$



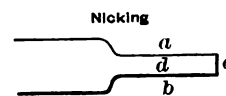
$a = 4^\circ$   $b = 4^\circ$   
 $c = 7^\circ$  Top  $d = 12^\circ$



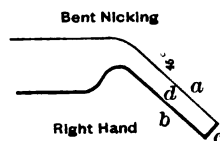
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 $c = 10^\circ$  Top  $d = 20^\circ$



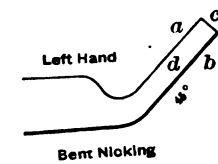
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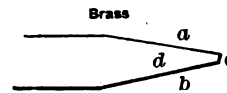
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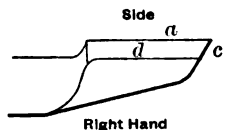
$a = 2^\circ$   $b = 2^\circ$   
 $c = 10^\circ$  Top  $d = 0^\circ$



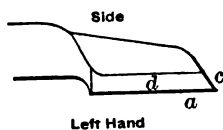
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 $c = 10^\circ$  Top  $d = 0^\circ$



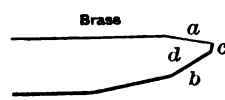
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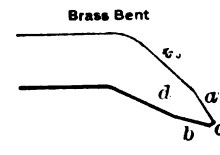
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Top  $d = 12^\circ$



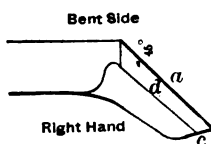
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Top  $d = 12^\circ$



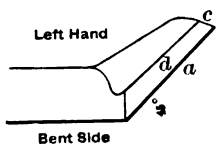
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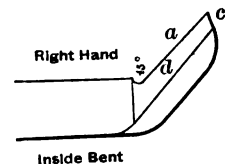
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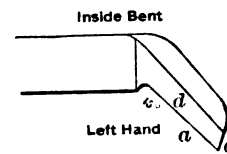
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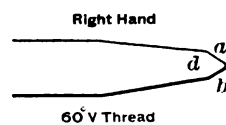
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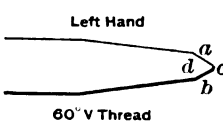
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Top  $d = 12^\circ$



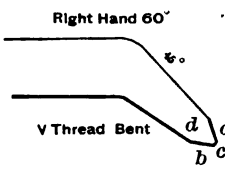
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Top  $d = 12^\circ$



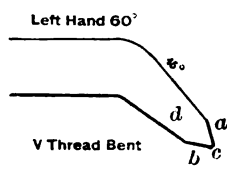
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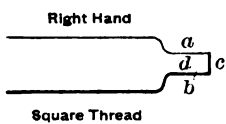
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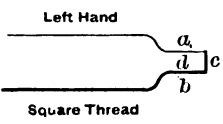
$a = 11^\circ$   $b = 5^\circ$   
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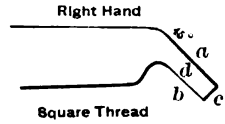
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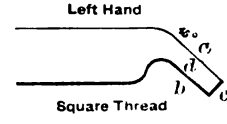
Angle of Clearance }  $a = 8^\circ$   $b = 0^\circ$   
 $c = 5^\circ$  Top  $d = 0^\circ$



$a = 0^\circ$   $b = 8^\circ$   
 $c = 5^\circ$  Top  $d = 0^\circ$



$a = 8^\circ$   $b = 0^\circ$   
 $c = 5^\circ$  Top  $d = 0^\circ$



$a = 0^\circ$   $b = 8^\circ$   
 $c = 5^\circ$  Top  $d = 0^\circ$

### Andrew Carnegie to His Workmen.

On the 30th ult. Andrew Carnegie, of Pittsburgh, spoke at length to the workmen at the Edgar Thomson Steel Works, the occasion being the presentation of the Carnegie Free Library, at Braddock. We quote from his remarks those passages which are of more than local or personal interest:

When articles were manufactured in small shops by employers who required only the assistance of a few men and apprentices, the employer had opportunities to know all, to become well acquainted with each and to know his merits. On the other hand, the workman, brought into closer contact with the employer, inevitably knew more of his business. More important than all, they came to know something of the man himself. This is changed. To make without loss a ton of steel rails and load them upon the car for a small fraction more than 1 cent per pound—4 pounds for a nickel—we must have thousands of miners, whom it is impracticable for a partner to see, and hundreds of blast furnace men, and in the converting works and steel-rail mills, only a few of whom it is possible for the employer to know.

Thus the employees become more like human machines to the employer, and the employer becomes almost a myth to his men. This is most regrettable; yet I see no remedy. Economic laws force the manufacture of all articles of general consumption into the hands of a few enormous concerns, that their cost to the consumer may be less. The manufacture of such articles cannot be conducted upon a small scale; works costing millions are required, as the amount per ton or per yard of "fixed charges" is so great in the total cost that, whether a concern can run or not in many cases depends upon whether it divides these fixed charges—which are practically the same in a large establishment as in a small—whether we can divide them by 1000 tons per day or by 500 tons per day of product.

A feeling of mutuality and partnership between the employer and the employed is desirable. Believe me, the interests of capital and labor are one. Mr. Carnegie now proceeded to show the fairness and advantages of

THE SLIDING SCALE SYSTEM OF WAGES, such as prevails at Braddock. He went on to say: You are no longer only employees; you are also sharers with us in the profits of our business, and, sooner than return to the old plan by which capital and labor were antagonized, and we had to quarrel every year upon the subject of wages, speaking for myself, I would retire from business altogether. As far as I am concerned, I will never again have anything to do with manufacturing unless labor is given a sliding scale. The coke-workers were exactly right in their recent demand for a sliding scale. You know that the Frick Coke Company, in which our firm is interested, have always favored complying with the request of the men for a sliding scale, and spent beyond \$100,000 last year to maintain a higher scale than competitors. Unfortunately the fall in the prices of coke has rendered further effort useless. The iron and steel business being dull and profitless, that of coke sympathizes, but I rejoice that the sliding scale is to be maintained, although we are driven by competition to pay the uniform scale of the district.

If you have read the newspapers, you will know that out of 13 mills engaged in the manufacture of steel rails in this country not more than three are running to their capacity. Only one mill in all the West is making rails (North Chicago), and I am sorry to say that even that one will not be able to run continuously, for they have

no orders ahead. What has the sliding scale enabled us to do at Edgar Thomson? It made us feel that we are prepared to make any sacrifice to give steady employment. The price—4 pounds of steel for a nickel—leaves profits to the average mill in this country out of the question. But you have a steady employment. I rejoice to see that, owing to the increased capacity of the mills, your aggregate wages are even higher than before. You have to work harder, no doubt, but in these times the owners have to work harder also.

### PITTSBURGH VERSUS CHICAGO.

In this connection you have read a great deal recently of a vast combination in steel-making formed in Chicago. I have no desire to underrate the importance of that movement, nor of \$5,000,000 to be applied to the building of works for plate-making, structural shapes and all the various forms of steel. I have expected such action for some time. There is nothing surprising to me about it. I have told this community, and I have labored for years to impress it upon the railroad companies of the State, that the latter had made it possible, by heavy reductions of rates upon material destined for points beyond the limits of the State, to manufacture a ton of Bessemer steel pig iron just as cheap in Chicago as it can be manufactured in Pittsburgh. There is no question about this. It is a matter of figures which I have given, which no man has ventured to contradict, and which has been publicly corroborated by Mr. Stewart, general freight agent of the Pennsylvania Company. I am credited with having said that the South was to be Pennsylvania's great rival; but what I said was that it was to be the chief competitor for foundry iron in the Eastern district of Pennsylvania. The South will not trouble Pittsburgh. Our competitor is not in the South—it is in Chicago.

In the year 1887 Chicago district made more tons of steel than the whole of Western Pennsylvania, and I warn capital and labor in Pittsburgh that a severe struggle is in the future for both.

### THE RAILWAYS ARE CHIEFLY RESPONSIBLE

for this situation. Every carload of coke you see coming from Connellsville in our own cars for Pittsburgh furnaces is charged just double the freight rate as if destined over the same ground for Chicago furnaces. There is no question of longer or shorter haul, for the coke is loaded and unloaded by us and carried in our own cars. The cost of hauling Pittsburgh or Chicago coke is just the same to the great monopoly which stakes against the State, whose creature it is. The Pennsylvania Railroad Company have already piled up \$19,000,000 of surplus, and last year had \$4,000,000 surplus after paying their dividend—all exacted unjustly from the State. The ore to Chicago furnaces is carried by Western railroads from the Lake Superior mines to Chicago at rates only a little above one-half those per ton per mile exacted from Pittsburgh furnaces by the Pennsylvania Railroad Company. The Baltimore and Ohio Railroad Company carry ore from the lake to Ohio furnaces for 50 per cent. less than the Pennsylvania Railroad exact for less distance upon ores to Pittsburgh. These two cases of discrimination alone add \$1 to the cost of every ton of iron made in Allegheny County, and many men go idle in your midst to-day in consequence of this injustice. We are in the hands of a grasping monopoly, and nothing we can do seems to bring us simple justice. The Pennsylvania Railroad Company, although its creature, has become the enemy of the State of Pennsylvania. All this, of course, must change. An indignant community will some day rise and exact justice through means of a State law, which will see that the traffic of the State of Penn-

sylvania is not charged more than similar traffic carried by Pennsylvania railroads through its territory.

Do not receive the impression, although we have great obstacles to overcome, that we are going to give up the fight. Never! We propose to fight it out on this line here, and I, for one, have no fear but what Pittsburgh will eventually be placed in a position in which it can hold its own, and increase and prosper. You are with us, we are with you—united thus we will stand and conquer.

### NOT IN A TRUST, AND WHY.

It is reported that our firm intended to join a combination of rail manufacturers. This would mean that we had agreed to give our men work for a portion of the year only, because no combination can act except by restricting production. Well, fellow-workmen, to be frank with you, there is temptation in our path. The firm could probably make more money just now, in depressed times, by manufacturing less, but where would labor be with work perhaps only half the year? In two of the three rail mills at Chicago men will not get work for even a quarter of a year, if indeed these mills run at all. If we had not made a partnership with our workmen we might have considered the proposition. Having them with us in the struggle, we reject it—and will continue to run our works to their capacity as long as orders for rails can be obtained at prices which do not involve a dangerous sacrifice of capital. Edgar Thomson Works are all right, and with fair railway rates, which Pennsylvania railroads will soon be forced to give, I repeat to you what I said on a memorable occasion, when we had a little unpleasantness, which is happily forgotten and forgiven on both sides: "It will be a cold day when Edgar Thomson gets left!"

### THE SITUATION AT HOMESTEAD.

Turning our eyes across the river, just the other day I received a letter from Homestead, dated March 14, from which I wish to make this extract:

*Mr. Carnegie*—DEAR SIR: A tradition prevails that once upon a time you promised to do something for Homestead soon. When or where or to whom this promise was made no one can exactly tell. It is enveloped in the mists of antiquity, and commands respect accordingly.

"Do something for Homestead?" Well, we have expected for a long time, but, so far, in vain, that Homestead should do something for us. But I do wish to do something for Homestead. I should like to see a co-operative society formed there. I should like to see a library there. I hope one day that I may have the privilege of erecting at Homestead such a building as you have here, but this letter compels me now to say that our works at Homestead are not to us as our works at Edgar Thomson. Our men there are not partners. They are not interested with us. On the contrary, an amalgamated association has for years compelled us to pay one-third more in the principal department of our works, the plate mill business, than our great competitors pay in Pittsburgh. They have compelled us to pay, and are driving away our trade in consequence, three times as much per ton for labor as our leading competitors outside of this district. More than one man at Homestead makes more not only than the foreman who is over him, but more even than the manager of all the works, and the great mass suffer in consequence.

Even to-day I learn that our firm is notified that after July next they will demand a further advance, ranging from 15 to 25 per cent. These men evidently require a library and need to read the newspapers. Steel business never so bad—competitors all reducing wages, and our men take this time to demand an advance! It is folly like

this that defeats the efforts of fair employers to benefit labor. Of course, no advance can be given, but the firm may be induced to give Homestead the benefit of a sliding scale, under which it can run steadily, and our men there make such wages as you make.

Fellow-workmen, personally I have arrived at this position: I have no desire to accumulate more money. The desire of my wife and myself is to know how best to administer what we have, and we both recognize to the fullest extent that in this great city, whence our revenues have come, most of these surplus revenues should be expended; but, with the exception of one or two partners, the 18 or 20 young partners now interested in our concerns are not rich men. Many of them are in debt for the interests which they own. When the firm cannot make interest upon its capital, these young partners will be worse off than nothing, for they will be in debt. The firm's operations must be conducted with the strictest regard to commercial principles. They must have their labor at the same prices as their competitors pay, or labor cannot obtain steady employment. The men to whom they give work must not seek to destroy the business of the firm by unfair exactions. If they do seek, they cannot be allowed to do so.

When the labor in the Homestead works, like the labor in the Edgar Thomson, goes hand in hand with us as partners, I trust that able, fair-minded men there will come forward, as they did here, and establish their co-operative society, their library and their beneficial society; and all I can say in answer to my correspondent is that, anxious as that correspondent may be for something to be done for Homestead, my desire for that is greater than my correspondent's, and I promise that the first dollar, or the first hundred thousand dollars, I receive from my investment at Homestead, if ever I receive a dividend, will be at the disposal of the men at Homestead, to be expended for their benefit.

The rates on pig iron which went into effect on the 1st from Southern producing districts are as follows:

	Birming- ham.	Chatta- nooga.	Shelf- field.
Allegheny, Pittsburgh and Wheeling.....	\$4.65	\$4.15	\$4.40
Chicago and Detroit...	4.00	3.75	3.75
Cincinnati.....	2.75	2.25	2.50
Cleveland.....	4.00	3.50	3.75
St. Louis.....	3.25	3.00	2.80
Kansas City and Leav- enworth.....	5.49	5.49	5.04
Louisville.....	2.50	2.25	2.25

These represent the leading markets.

The new building just completed on the corner of Wall and William streets for the Bank of America is among the most substantial and attractive banking houses down-town. The style of architecture is Italian Renaissance, the materials being Maine granite and Indiana limestone. The façades are so treated that there are only three main horizontal subdivisions, notwithstanding the fact that there are nine stories. The lowest subdivision consists of the basement and first story, the second consists of two stories also, and the third consists of three stories, and includes the upper arches, above which is the main cornice. This cornice is treated with a broad frieze, which is pierced by the windows of the seventh story, while above the main cornice rises the upper story, taking the place of a high parapet. The cost of the whole is to be about \$500,000. The architect is Charles W. Clinton and the builder D. H. King, Jr.

The executors of Augustus Schell, formerly collector of this port, obtained a judgment for \$154,275 against Joseph C. Williams, on a promissory note for three years.

## THE WEEK.

The Samoan question has incidentally caused the destruction of three vessels and the loss of life of 50 men belonging to the United States Navy which had been concentrated in the harbor at Apia during the season when hurricanes are almost regular visitors. The Trenton, Vandalia and Nipsic were driven ashore, and excepting the latter all have become total wrecks. It is conjectured that had it been possible to get up steam immediately they might have escaped. Commercial vessels never linger at the islands longer than is necessary during the "hurricane season." The Germans lost two men-of-war and 96 men during the blow, and a third vessel, like the Nipsic, was driven ashore.

Building operations in Philadelphia during March were the largest in the history of the city, involving \$4,000,000.

The elevated railroad system in Brooklyn is being rapidly extended into the remote suburbs. The Myrtle avenue extension of the Union road to Broadway will soon be completed and work on the Fifth avenue branch has been resumed, affording a direct connection with Greenwood. The Kings County road will shortly have an extension to the new Twenty-sixth Ward, and will build a branch from Myrtle avenue through the Eastern District to Greenpoint and Newtown Creek, putting these remote parts within easy reach of the City Hall and bridge. The valuations of real estate are likely to be much affected.

Success in commercial life is promoted by a liberal education. At Princeton's Alumni dinner last week Chauncey M. Depew said: "There is this peculiarity about this rush for office, when 4,000,000 of the 18,000,000 of American voters are aspiring, that very few are the graduates of great universities." The reason for this, said Mr. Depew, was that a college training developed manhood and independence and qualified its recipients for the more permanent and honorable prizes of professional and commercial life.

Eight non-union Swedes in Holbrook, Mass., employed on lasting machines in White's shoe factory, were blown up with dynamite at their boarding-house. No injury was done beyond wrecking the building.

The American Dredging Company, of Philadelphia, have contracted to deepen the ship channel at Baltimore for \$188,000.

The Philadelphia and Reading Railroad are expected to run through trains to Boston and the East upon the completion of the Pennsylvania, Poughkeepsie and Boston Railroad. With this connection the Reading will run trains over the North Pennsylvania Railroad to Bethlehem and thence to the bridge, reaching connections which now exist on the other side. It is likely that this route will be used for carrying Schuylkill coal to New England.

A large portion of the crib bulkhead built by the Lehigh Valley Railroad for their Jersey City terminus slid into the river, carrying with it several railroad tracks and bringing a year's labor to naught.

A site has been selected for the new Chamber of Commerce in Boston, to cost about \$250,000.

The assessment roll of the property owned by the city of Montreal places its value close upon \$5,000,000.

There are indications of an early opening of the St. Lawrence River.

The Montreal Gazette, Government organ, referring to President Harrison's proclamation in relation to Behring's Sea, does not touch the real points in the controversy, as the United States are acknowl-

edged to have absolute jurisdiction within a marine league of the shores of Alaska. As regards the open sea, "Great Britain by treaty with Russia secured the recognition of the right of fishing by British subjects therein."

Commercial union with Canada was earnestly advocated by Erastus Wiman, of New York, at a dinner of the Portland Board of Trade last week. Among other things, he said: "Commercial union has become a question upon which the continued welfare of the whole of the New England States may presently depend. With the opening of the iron and coal mines in the Southern and Western States a great change is occurring in this country, somewhat to the disadvantage of the Middle States and New England. Under this disadvantage numerous heavy machine works in New England are likely to be hampered because of the disadvantage in the price of material." Mr. Wiman asserted that in Nova Scotia ample supplies of the best iron, the best coking coal and of chemically pure limestone lay close to each other within a radius of 6 miles from sea and railway, and he argued that if they should be worked under commercial union the vast industries in which New England used to excel all parts of the United States—the manufacture of machinery, locomotives and heavy stationary engines—might be regenerated.

The president of the American Bank Note Company, A. D. Shepard, bought the Electric Building on Church street for \$175,000. The property overlooks Trinity Churchyard. The New York Coffee Exchange bought three lots on Beaver street, adjoining the Cotton Exchange and running through to Pearl street, for \$230,000. Cotton and coffee will therefore be neighbors.

Interesting facts pertaining to the grain production of the United States are given in the March crop report of the Department of Agriculture. The amount of wheat in the country retained for consumption is almost identical with that of last year, but the distribution prior to March 1 has fallen: from 256,166,200 bushels in 1888 to 213,837,320 bushels in 1889. As to the corn crop, the report says that the quantity of corn consumed has been slightly greater than ever before recorded, about 1,201,000,000 bushels in five months after ripening, or from October 1. Still the quantity on hand is quite as large as ever before, though only a few million bushels more than was reported three years ago. The percentage of the entire crop on hand March 1 is slightly below that of 1886, but greater than any other year. The value of the whole crop, if calculated on the basis of present prices, is \$635,200,000. December prices would give about \$42,000,000 less.

Railroad building is at an end in China for the present, the Conservatives having gained complete control of the young Emperor. A Tien-tsin letter says it is certain that the fifth prince, the oldest surviving brother of the Emperor Tao Kwang and uncle of the present Emperor, Kwang Hsu, has formed a combination with the Emperor's tutors and the leading men of the six Boards of Government and has succeeded in blocking all plans for the extension of the Tien-tsin-Kaiping Railroad toward Peking. The Throne has been forced to withdraw its sanction for the extension and to forbid all further proceedings on the part of the company. The proposals recently sent in for the rails and cross ties have been rejected.

The report of John Bigelow, Commissioner of the United States to the Brussels Exhibition last year, to the Secretary of State, sets forth the fact that the exhibition was a purely private speculation, which the Belgian Government did not

take any particular interest in until within a short time before it opened. In addition to this there was a deep-seated hostility on the part of a large portion of the Belgian press toward the persons in charge of the exhibition, in consequence of which the affair was not so successful as it might have been. American exhibitors numbered only 74, instead of 200, as had been expected, but of these Mr. Bigelow says 54, or about 75 per cent., received awards of prizes. Of the \$30,000 appropriated for the expenses of the commission, only \$17,118 were expended.

It is said that the Naval Board will recommend preparing for service the 12 old monitors lying at navy yards, some of which have remained idle for 20 years. The monitors at Richmond are the Ajax, Canonicus, Mahopac, Manhattan, Wyandotte, Catskill and Lehigh. Those at League Island are the Josen, Montauk and Nahant. The Passaic is at Annapolis and the Nantucket at New York.

Ferdinand Vandertaelen, an alleged victim of the copper speculation in Antwerp, was formerly mayor of that city. He is reported to have failed for \$8,000,000, an amount \$2,000,000 in excess of the total assets. Immediately on this event becoming known he committed suicide. Large quantities of wheat held in New York on account of parties representing his interests were sold in this market at a decline.

Private organizations cannot be taxed as corporations, according to the decision of Judge Barrett in the Supreme Court of this city. The case before him was brought on a writ of *certiorari* for the review of the Tax Commissioners' action in assessing the capital stock of the National Express Company. The company were formed in 1853, but is not incorporated. Since the organization, the Judge says, substantial privileges have been conferred upon joint-stock companies. The privileges are undoubtedly corporate incidents, but do not in terms create corporations, nor do the acts profess to authorize them. On the contrary, they expressly declare the opposite intent. A corporation cannot be formed by a private agreement between individuals. The franchise must proceed from the State; and even the State cannot compel people to accept its bounty. There is, in fact, no statute of the State providing for the formation of joint-stock companies or limiting their organization. The conferring of these privileges no more creates a corporation than would general legislation conferring similar privileges upon ordinary partnership. Judgment is given for the company.

Charles Arbuckle, the well-known coffee man, has made preparations to erect a \$1,000,000 building on the site of the Hotel Dietor, opposite the City Hall, Brooklyn, and will begin work immediately.

The New York Central road is going to try a new kind of fish-plate for connecting the rails. It is more than 3 feet long and follows the curves of the rail, fitting very closely, and overlapping to the sleeper.

Electric subways make no end of trouble. The last move against them is an injunction by the Western Union Telegraph Company restricting Mayor Grant and the Subway Commissioners in their efforts to put the aerial wires underground. The recent explosions of gas in the conduits offered a timely argument in support of the view that the subways are useless. Engineer Kearney, of the Board of Electric Control, charges that the explosions are wholly due to rotten gas-mains. While building underground conduits, he says, "many of the mains were found to be so rotten that they could not be moved. Some of the iron pipe in which gas is

conveyed was laid 30 years ago, and it has so rusted and decayed that it crumbles to pieces when exposed to the air. I am informed that one-third of the gas manufactured is accounted for by the companies on the ground of leakage—that millions of cubic feet are absorbed by the earth daily, and any person who has been in a newly-dug trench can realize the possibility of this being true. This leaking gas penetrates the sewers, basements and, in a good many instances, the upper floors of buildings, and we are breathing poisoned air continually. Unless radical steps are taken the evil will grow more rapidly as the pipes decay. We will, however, doubtless be able to devise a plan to prevent subway explosions." The injunction obtained from Judge Wallace, in the United States Circuit Court, is based chiefly on the allegation that the insulating material is baked and destroyed in the subway by heat from the steam-pipes adjacent to the wires. Injecting powerful currents of fresh air may remove all difficulties.

In some respects Philadelphia does not suffer from a comparison with New York. The Twenty-third Ward in that city contains 42½ square miles.

Captain Howard Patterson, formerly chief inspector of the New York Navigation School, has been made admiral of Legitime's Haytian navy, and accompanied by an experienced gunner has started for his destination.

No great success has been attained thus far in silk culture in the United States, although in years past very fine exhibits of cocoons have been made at the California State fair in Sacramento and elsewhere. More recent efforts are spoken of encouragingly by the president of the Women's Silk Culture Association of the United States in the annual report just issued, who says that people are learning to raise cocoons and tree-planting, and that when this becomes general the country could in a short time "raise not only its own silk but much more." Persons who remember the *morus multicauli's* furor of perhaps 20 years ago and the large area then devoted to the culture of mulberry trees, together with the losses and disappointment that followed, will not give undue importance to more recent predictions. In California all the conditions as to labor, soil and climate were in the highest degree favorable, and the processes in many instances were conducted by practical silk-growers from China. Nevertheless, surveying the field to-day, it does not appear that any very remarkable progress was made toward establishing a permanent industry. It is only in the manufacture of certain descriptions of goods from the raw material that there has been a substantial gain.

Dr. John Swinburne, for six years Health Officer of this port, and to whom, more than any other man, the city is indebted for its excellent quarantine arrangements, died in Albany, March 28.

An act of the Legislature was ratified at the polls in Wilmington, N. C., which practically exempts all new manufacturing enterprises from municipal taxation for 10 years.

The President's Oklahoma proclamation will throw open to homestead entry on April 30 about 1,800,000 acres, and a lively scramble for claims is in prospect. Boston finds special satisfaction in the announcement from the fact that her citizens are so largely interested in the Atchison road, the only one penetrating this region, and which will receive an immediate benefit. While the land to be settled cannot be taken in larger lots than 160 acres to the individual, some way will doubtless be found to start a real estate speculation. The late opening of the region will pre-

vent seeding with most crops except corn and vegetables this season. Officials of the Rock Island Railroad and a corps of engineers have started from Topeka, Kan., to make the final survey for an extension through the Indian Territory.

Large amounts received by collectors for the Market Bureau in this city are not accounted for, and the disappearance of the books, as well as the "cooked" condition of some that have been examined, affords reasonable ground for suspicion that the city treasury has suffered during the last few years to the extent of some hundreds of thousands of dollars. Several alleged "boodlers" are more or less implicated, and prolonged investigations are in prospect.

Wheat statisticians in the Northwest compute the stock of wheat in that section of the country awaiting a market at 20,000,000 bushels.

The Cleveland Plain-Dealer states that, with the opening of navigation, 28 large steam and sail vessels will be added to the Cleveland fleet, and altogether 242 boats, with a gross tonnage of 164,644.56, will be enrolled at Cleveland. From figures recently taken from Lloyd's register, an approximate estimate of the value of this immense amount of floating property places it close to \$10,000,000. These figures are not startling when it is known that for three years past the shipyards of the lakes have been turning out from \$6,000,000 to \$8,000,000 worth of new boats each year, with Cleveland's share of the work ranging from \$2,000,000 to \$3,500,000. Of the 242 vessels referred to 113 are sail and 129 steam—nine of the latter being steel. The F. W. Wheeler Company, of Bay City, Mich., have 14 vessels on the stocks, with an aggregate value of \$1,000,000. Five of them are between 260 and 281 feet in length. The largest will all be ready to launch in May.

The strike of weavers in Fall River, Mass., collapsed after lasting a fortnight. It was begun with the purpose of forcing an advance of wages, and some 6000 weavers joined in it, practically closing all the mills in the city. The employers refused to yield, claiming that they could not afford to raise wages. The workmen returned only after exhausting their surplus funds.

American lard is a large and increasing factor in the export trade of this country, despite the hostility of several foreign governments. Refined lard, however, has fallen off in the export list fully 50 per cent., foreigners preferring to refine for themselves. Statistics compiled by the New York Produce Exchange indicate an excess this season compared with last of nearly 35,000,000 pounds from the Atlantic seaboard. Since November 1, the beginning of the season, there have been exported to all foreign ports an aggregate of 141,797,354 pounds, against 107,047,792 pounds during the corresponding period last season. This large increase, coming as it does in the face of reports of foreign discrimination against the American product, is regarded with considerable surprise by members of the trade, who ascribe it mainly to the low prices that have been current this season. The increase in this season's exports is greatest in the United Kingdom, which has so far taken in round numbers 20,000,000 pounds more than last season, while the Continental ports have taken about 15,000,000 pounds more.

Charles P. Huntington, associated with Senator Stanford, of California, has procured authority to issue \$50,000,000 additional stock, which will provide means for absorbing several thousand miles of railroad on the Pacific Coast north of the Sacramento River, thereby extending the Southern Pacific system over a large expanse of territory.



## MANUFACTURING

### Iron and Steel.

In answer to a rumor that a syndicate of capitalists of Louisville, Ky., were endeavoring to purchase the Millvale steel plant of Graff, Bennett & Co., at Pittsburgh, for the purpose of developing a new process for the manufacture of steel, we can report that there is no truth in the rumor whatever. A party of Louisville gentlemen visited the Carbon Iron Company, of Pittsburgh, one day last week for the purpose of purchasing several old trains of rolls, with engines and other machinery, which that company are anxious to dispose of, with a view of replacing the same with entirely new machinery. According to reports extensive experiments were made at the plant by these parties, but we are informed this is also untrue. In this connection we may state that for a new concern the Carbon Iron Company have been more than usually successful. At present they have enough orders on hand to keep their plant in full operation up to July next. Among other orders the company have received a contract to supply about one-half of the material for the new Merchants' Bridge, now in course of erection at St. Louis.

The new plant of the Muncie Nail Company, at Muncie, Ind., contains 16 puddling furnaces, 4 heating furnaces and capacious annealing furnaces. The machinery includes a 20-inch train of rolls, a plate train, muck train and 50 nail machines. There is also a complete foundry for iron and brass castings, and a cooper shop for the manufacture of kegs. This concern is the successor to the Greencastle Iron and Nail Company, of Greencastle, Ind., the plant having been removed to Muncie some time ago. When running to their full capacity the new concern will employ about 200 hands.

About eight months ago the Cambria Iron Company, of Johnstown, Pa., blew out and dismantled their Frankstown furnace, at Frankstown, Pa. About a month ago the old stack was sold to a party who turned it into a lime kiln and is now making lime in it. It was an old-time furnace that ran on fossil ore, producing mill and foundry pig, and was entirely worn out and out of date for modern work.

The new works of the Roanoke Rolling Mill Company, at Roanoke, Va., are approaching completion.

On the 22d ult. the Longdale Iron Company, of Longdale, Va., blew out their No. 1 furnace with the object of pulling it down and replacing it by a better and slightly larger stack.

The Warwick Iron Company, at Pottstown, have decided to work up the stock of ore, &c., on hand and blow out for repairs. Up to the end of the month the furnace had made 103,000 tons during the present blast.

A reduction of 5 per cent. in the wages of unskilled labor and 10 per cent. in that of skilled labor went into effect at the Pennsylvania Steel Works, at Harrisburg, 1st inst. Notice has been given by the Columbia Iron Company, in Lancaster, Pa., that their mill will be closed on April 6th owing to the dullness of the market.

Alex. Laughlin & Co., engineers and contractors, of Cleveland, Ohio, report, under date 28th ult., that they recently furnished the Middlesport Steel and Nail Works with working drawings for a Smith ingot-heating furnace, with working hearth 7 x 20 feet, which is now in course of erection. They also sold the Eureka Iron and Steel Works, Wyandotte, Mich., a shop-right for the use of their improvements in furnaces and pro-

ducers, and furnished them with working drawings of a bar-mill furnace 7 x 18 feet, which will be built at once; upon the completion of which they design changing their entire mill to this system.

In our issue of March 28 we stated that the old Cortwright rolling mill, Allikanna, Ohio, would start up and be operated by the National Tube Works and the product be shipped to McKeesport. We have the authority of J. R. Jackson, of Pittsburgh, for the statement that the National Tube Works will not operate the mill, since they do not own it. The product will be sold in the open market.

The Etna Iron and Steel Company, of Bridgeport, Ohio, have issued a neat pamphlet, giving an Eastern price list of extras on bar iron, bar steel, angles, tees, channels, light rails and iron and soft steel sheets and plates. The pamphlet contains also tables of weights of flats, rounds and squares, tires, ovals and half ovals, angles, tees, channels and plates.

Charles L. Miller, superintendent of the Missouri Furnace Company, South St. Louis, writes us: "For the week ending March 16 No. 1 Furnace of the Missouri Furnace Company made 645 gross tons of No. 1 Bessemer pig. This is the second time since going in blast on October 15 that about this output has been reached, the product for the week ending January 26 having been 644 tons. For the size of the furnace we consider this pretty good work. The total height is 58 feet 2 inches, and the diameter of bosh 15 feet 2 inches. The working height of the furnace under the hopper is 54 feet, and the working capacity is 6428 cubic feet. We run to make high silicon Bessemer iron, and cannot, therefore, claim much in the way of low fuel, but even that item is very good. To make the above 645 tons the furnace had to clear itself eight and one-half times during the week, putting the stock through in 19½ hours. The furnace is equipped with two Gordon stoves 50 x 19 feet, the average temperature of blast being about 1280°. The best day's work has been 101 tons, the best week 645 and the best month 2630. The best day has been in the best month, but the best week has been in the past month. The 645 tons is at the rate of 100.3 tons per week per 1009 cubic feet capacity, which I think will compare favorably with some of the best records. We use ores from Iron Mountain and Connellsville coke for fuel, with a small percentage of Illinois coal."

Notices have been posted in the rolling mill of the Columbia Iron Company, at Columbia, Pa., that after April 6 \$3.50 per ton will be paid for puddling iron and other ton men in proportion. The management state that either a reduction or complete shut-down is necessary. The Penn Iron Company, Limited, of Lancaster, Pa., have also posted the same notice of reduction.

The United States Iron and Tin Plate Company, Limited, of Demmler, Pa., are completing the erection of a large sheet mill to their plant. This mill was planned and partly built in the fall of 1887. The company inform us it will be ready to commence operations about June next.

The National Tube Works Company, of McKeesport, Pa., are erecting 20 additional puddling furnaces at their plant, which, when completed, will give the company a total of over 100 puddling furnaces. The new plate mill recently completed by this firm is ready for work, and will be put in operation at an early date.

Week before last the blast furnace of the Girard Iron Company, at Girard, Ohio, turned out 1292 gross tons of pig iron.

This remarkable output exceeds by nearly 75 tons that of any equal period in the history of the furnace. This plant has been in continuous blast for 113 weeks, during which time the production amounted to 117,819 tons of pig iron, an average of 1042 tons per week.

The Stewart Iron Company, Limited, at Sharon, Pa., are erecting a building 22 x 26 feet, to be used as a laboratory.

McLanahan, Smith & Co., Limited, lessees of the Juniata Rolling Mill, at Hollidaysburg, Pa., have reduced the wages of their puddlers from \$3.75 to \$3.50 per ton. The same action has also been taken by the Hollidaysburg Iron and Nail Company, of that place.

The stockholders of the Youngstown Bridge Company, recently organized at Youngstown, Ohio, have elected the following directors: James Neilson, Hamilton Harris, B. F. Boyd, Ed. Hazeltine, J. H. Thompson, Andrew Millikin and L. E. Cochran. The directors elected James Neilson, president; L. E. Cochran, vice-president; B. F. Boyd, secretary and treasurer. The entire capital stock of \$100,000 has been subscribed, and work will be commenced at once to erect the necessary buildings at Haselton. One hundred men or more will be employed.

Hecla Furnace, of the Hecla Iron and Mining Company, at Ironton, Ohio, was blown out on Monday, the 25th ult., for the purpose of being relined and repaired.

The entire plant of the Spaulding Iron Company, at Brilliant, Ohio, which has been idle for some time, resumed operations in full last week.

The stockholders of the Burns Copper Welding Company, recently organized at Pittsburgh, have elected W. J. McKeever president of the concern. This is the company recently formed to control the Burns patents for welding copper, and it is understood will shortly secure a property and commence operations.

The Tennessee Range and Mfg. Company's works in Nashville, Tenn., were burned, 27th ult.; loss, \$65,000.

The large pipe foundry of the West Superior Iron and Steel Company, of West Superior, Wis., is under roof, and the construction of the pits inside and the placing of machinery is progressing. The foundry will begin melting for the purposes of this company toward the latter part of May, and it is expected that the manufacture of pipe will begin in July. The foundation for the 20 x 80-foot blast furnace was put in last fall, and work upon it will be resumed with the opening of spring.

Joshua S. Ingalls & Co., of Troy, Ohio, announce that they have enlarged their facilities for the manufacture of Craig steel, which is made from a special mild steel by their own process. The sheets, which are destined chiefly for the uses to which Russia iron is put, are cut into 20 x 60-inch, and are packed in cases of about 250 pounds each.

It is reported that the Crown Point Furnace, at Crown Point, N. Y., is soon to go in on Bessemer pig.

No. 2 stack of the Port Henry Furnace Company, Port Henry, N. Y., has reached the greatest output since it has been built, making 2023 gross tons during March, the last week's work being 482 gross tons, from all native magnetite from the mines of Witherbees, Sherman & Co. The furnace is now under the management of H. M. Langdon, formerly of Chester, Pa.

Rosena Furnace, at New Castle, Pa., operated by Oliver Brothers & Phillips, continues its exceptional work under the management of G. E. Tener. In March it

produced 5442 gross tons, and its average product for the four months of December, January, February and March has been 5072 gross tons of mill iron. This product is remarkable considering the equipment, the old-style pipe hot-blast stoves being 17 years old and the engines and boilers dating from the same time. Considering everything, this record is, we believe, unsurpassed.

In March Girard Furnace, in the Mahoning Valley, Ohio, eclipsed its best former record, making 5708 gross tons in that month.

The Allegheny Bessemer Steel Company, of Pittsburgh, are ready to go on double turn.

#### Machinery.

The Fort Pitt Foundry of Mackintosh, Hemphill & Co., Limited, at Pittsburgh, was damaged by fire to the extent of \$60,000 on Tuesday, the 26th ult. The fire started in the ingot mold foundry, from whence it spread to the small work foundry adjoining, the second story of this small work foundry being the pattern shop, while the third story was used as pattern storage loft. These buildings were entirely destroyed, with their contents. The machine shops, main foundry and steel foundry were untouched. There will be no hindrance of work in any of these departments, except where needed patterns were destroyed. The firm started to replace these at once, and have also arranged with other foundries to fill their orders for ingot molds until they can get ready to make them, which will be in a few weeks. The interruption to the business of the firm is about as little as could result from a fire of such extent.

The St. Joseph Pump Company, St. Joseph, Mo., write under date of 26th ult. as follows: "Our business was never better. We are 60 days behind with our orders and are running night and day, while prospects of a continuance of this state of affairs are very flattering."

At the annual meeting of the stockholders of the American Waltham Watch Company, of Boston, Mass., held on Thursday, the 28th ult., it was voted to increase the capital stock \$1,000,000, making it \$3,000,000. A dividend of 50 per cent. was declared. Royal E. Robbins, treasurer of the company, said with regard to the dividend that it had been declared on the advice of the late Sidney Bartlett shortly before his death. It was, he said, a cash dividend. The company have a surplus of \$2,000,000 above their capital, for which the stockholders had nothing to show, and this course had been taken that they might have some evidences of their property. The capital stock had been increased to the extent of the cash dividend, and those of the stockholders who wished could take the cash they received in dividends and purchase new stock at par in *pro rata* proportion to what they already held. It was not a stock dividend. The other \$1,000,000 surplus would be used in carrying on the business of the company. There would be no addition to the works on the head of the increase in stock. In 1865, when the capital stock was \$300,000, a dividend of 150 per cent. was made and the stock increased to \$750,000. In 1880 a dividend of 100 per cent. was made and the capital increased to \$1,500,000, and in 1885 the stock was increased \$500,000, for which the stockholders paid.

A. J. Boyce, proprietor of the Industrial Foundry and Machine Works, at East Liverpool, Ohio, under date of the 30th ult., writes us as follows: "Our works, which were totally destroyed by fire January 3 last, are now almost completed, and will be in running order in every department within the next 20 or 30 days. Our build-

ing is being constructed entirely of iron, which will be a preventative against anything of like nature happening to us which occurred at that date. Part of our new machinery has arrived and others being forwarded daily. When we have everything completed and in running order we will have one of the finest and most substantial plants of the kind in the State of Ohio, or even throughout the country."

The latest achievement of the Billings & Spencer Company, Hartford, Conn., is the making of drop forgings from Tobin bronze, a new metal produced by the Ansonia Brass Company. It is excellent for parts of engines and machinery which are exposed to corrosion, and where greater strength is required than is afforded by ordinary brass or bronze. This company have just added two more drop hammers, bringing the total number now in operation up to 40. They have applied for a permit to erect an addition to their forge shop 410 x 90, more room being needed for their increasing business, and report a good outlook in their line for the remainder of the year.

E. E. Garvin & Co. announce that they have secured a long lease of the new building at Laight and Canal streets, New York, their new quarters containing about 45,000 square feet of floor room and having light on three sides. They propose to add to their modern plant new facilities as fast as required.

Wm. Nehring & Co., mechanical engineers, of Evansville, Ind., while making a specialty of metal patterns, are well equipped for doing all kinds of machine work and for making gray and malleable iron castings. This firm have had a shop experience of many years and are well qualified to handle work in a satisfactory manner.

We have received from B. W. Payne & Sons, of Elmira, N. Y., an illustrated description of their high-speed steam engines. For some time the requirements of the trade in steam engines have been in the direction of close regulation and economy in the use of fuel. The engines made by the above firm should afford the same economy as the Corliss, and should have the close regulation of the single-valve automatic, since in them the Corliss wrist-plate and valves are combined with the shaft governor.

#### Hardware.

During the month of February last the nail factory of the Salem Wire Nail Company, at Salem, Ohio, turned out 40,000 kegs of wire nails.

Plumb & Lewis Mfg. Company, Grand Rapids, Mich., report that they have recently had large export orders from Australia, England, Germany, France and other foreign markets. They are increasing their force to meet the demand.

The Humphrey Tool Company, Warren, Mass., have recently been increasing their facilities for manufacturing their various specialties. They have put in two new upright drills, one a three-spindle sensitive drill. Also a water emery grinder. Trade is reported to be opening well both in this country and for export.

The Standard Horse Nail Company, of New Brighton, Pa., are inviting bids for the erection of an addition to their factory that will double the present floor room of the establishment. The main building, fronting on Second street, is to be extended on the south 52 feet 2 inches, making the front of the entire building 263 feet. The extension proposed will be extended of equal width back to Fourth street, a distance of 248 feet 3 inches, making the new addition 248 feet 3 inches by 52 feet 2 inches. The structure is to be of brick, one story high, with cement

floor and iron truss roof, with corrugated iron covering. There will be no woodwork about it except the window frames and sashes, which will make the factory as nearly fire-proof as is possible.

#### Casting Small Ingots.

In July last year G. F. McLeaur and W. H. Faber, Jr., were granted a patent on an ingot mold, permitting direct rolling into slabs, without the intervention of blooming and hammering. The mold now in general use for casting steel ingots is made of cast iron in one piece, having the appearance of a truncated pyramid, the taper being very slight and just sufficient to allow clearance in "drawing." This shape of mold has proved itself unsuited to the purpose, as there is such a difficulty in drawing the ingots that a large supply of extra molds must be kept on hand to meet the requirement of the converter's successive heats, and many of the molds are soon rendered useless by the rough treatment received by them in the effort to draw. All this entails heavy expense upon the manufacturer of steel. Again, the ingot produced in this old form of mold is honeycombed and extremely heterogeneous, and requires considerable reworking to render it of the requisite homogeneity for the uses to which it is to be applied.

The inventors state that they have demonstrated by actual experience, upon a very large scale, that ingots cast in their mold are in a perfect condition for rolling without the intermediate step of blooming, which they claim in addition to its cost is positively injurious to steel of certain kinds, particularly low-grade steel, the reheating of the steel rendering it more brittle and less ductile than that not subjected to the blooming. Another item of cost in the ordinary method is that where two or more molds are cast at the one time on a single casting table there is a gate-piece to each ingot and a runner common to the several ingots which must be broken off, and is then valued only as waste. In their mold for casting they make but one runner where there are now two, thus reducing this single item exactly one-half, and they claim that on account of the peculiar shape and combination of their molds, the ingots are much more readily removed, and that there is such a small possibility of breaking the molds that the cost of molds and amount of labor required in the casting and drawing operations are greatly lessened, thereby lessening the cost of the steel ingots.

They aim to produce an ingot-mold in which all the desirable features of an open mold are retained and all the objections to a closed mold are overcome.

The ingot-mold has its sides and bottom and one end solid and its top and the other end removable, the top being formed of a single piece of the same metal as the mold and the removable end formed of fire-brick having an orifice through its center for the passage of the molten steel. Two molds have a common run and a removable bar placed between the two molds and under the run, whereby the ingots can be readily drawn at the one time.

Advices from Pittsburgh are to the effect that the shut-down of several of the coal works along the Monongahela River is but the beginning of what will probably be a general shut-down in all of the pools. One operator has stated that within a few days all of the river mines will be shut down, and that work will not be resumed until the miners agree to accept a reduction of  $\frac{1}{4}$  cent per bushel, which would put the rate of mining at 24 cents. If all the lines along the Monongahela River close it will throw about 5000 miners out of work.

# The Iron Age

New York, Thursday, April 4, 1889.

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## Freight Rates in the Eastern Iron Trade.

Last week we published abstracts giving an expression of opinion by two of the leading Northern ironmasters, Andrew Carnegie and Abram S. Hewitt, on a subject which has been eagerly discussed in a quiet way by producers east and west of the Allegheny Mountains. During the past few years there has been a good deal of shifting of markets in raw and finished irons. The invasion of Southern pig has only been one phase of this revolution. The introduction of natural gas in the West has been another cause of irregularity in finished articles. But the marketing of growing quantities of goods from distant producing centers has been chiefly due to changes in the freight rates by more progressive railroad managers, while in other producing sections the roads have adhered to the policy of exacting all which the traffic would bear years since. The trouble lies in this, that rates which gave manufacturers a living chance a decade ago are now sapping their vitality in an alarming manner. With the fierce competition which has prevailed for years, every means has been exhausted to lower costs. Those concerns who had accumulated a surplus or could command additional capital have striven to keep pace with technical progress by improving their plant and equipment. The majority have practiced the closest economy, and many have been forced to cut down wages to a low figure. The point has been reached when little or nothing can be done by the manufacturers themselves. The time has come when it rests with the managers of the railroads to act if they want to avoid the rapid destruction of large amounts of capital, and, what may appeal to them more forcibly, the withdrawal from many important communities of the means of subsistence, with the decline in remunerative local traffic which that implies.

In other parts of the country railroad managers are content to recoup themselves for hauling at cost, or even less, the large tonnage offered by iron-manufacturing and allied establishments by fair rates of freight on the supplies and merchandise consumed by the community dependant upon local industries. That has been the policy so successfully pursued by the Southern roads. Those of Eastern Pennsylvania particularly have looked more upon the freight bills paid by manufacturers than upon the income derived from supplying a large population.

It is possible that railroad managers are possessed of the idea that, through natural conditions over which neither the carrier nor the producers can exercise control in the long run, the iron industry of New York, New Jersey and Eastern Pennsylvania is doomed to the fate which overtook that of New England. They

may reason that it will pay them better to suck from it the last drop of blood while it lingers than to waive income to help it maintain a lingering, precarious existence. We know that iron-makers in other sections have boldly proclaimed that to be the fate of an industry which was once prosperous. We have in mind the dictum of a Western manufacturer who claimed that before the end of the century is reached the steel rail industry would abandon the territory east of the Allegheny Mountains. Such boasting should have no weight with well-informed men. The maligned section possesses resources which place it beyond any danger, providing it is given an equal chance.

Through the courtesy of a number of ironmasters *The Iron Age* has been enabled to present some figures showing what rates of freight are exacted on raw materials and finished products. We give below in tabulated form the length of haul, the total rate and the rate per gross ton per mile.

### Iron Ore.

93 miles, \$0.95 rate, 1.02 cents per ton per mile.  
125 miles, 1.14 rate, 0.91 cent per ton per mile.  
65 miles, 1.05 rate, 1.61 cents per ton per mile.  
351 miles, 2.70 rate, 0.77 cent per ton per mile.

### Anthracite Coal.

60 miles, \$0.90 rate, 1.50 cents per ton per mile.  
48 miles, .77 rate, 1.67 cents per ton per mile.  
140 miles, 1.81 rate, 1.29 cents per ton per mile.  
17 miles, .50 rate, 2.94 cents per ton per mile.

### Limestone.

29 miles, \$0.47 rate, 1.62 cents per ton per mile.  
44 miles, .73 rate, 1.64 cents per ton per mile.  
28 miles, .43 rate, 1.53 cents per ton per mile.  
(Return coal cars.)

### Pig Iron.

110 miles, \$1.17 rate, 1.06 cents per ton per mile.  
49 miles, .60 rate, 1.23 cents per ton per mile.  
9 miles, .30 rate, 8.33 cents per ton per mile.  
5 miles, .30 rate, 6.00 cents per ton per mile.  
45 miles, .60 rate, 1.33 cents per ton per mile.  
93 miles, .90 rate, 0.97 cent per ton per mile.  
65 miles, .90 rate, 1.33 cents per ton per mile.  
12 miles, .35 rate, 2.91 cents per ton per mile.  
113 miles, 1.25 rate, 1.11 cents per ton per mile.  
140 miles, 1.40 rate, 1.00 cents per ton per mile.  
232 miles, 2.86 rate, 1.08 cents per ton per mile.  
85 miles, 1.35 rate, 1.59 cents per ton per mile.  
100 miles, .75 rate, 0.75 cent per ton per mile.  
100 miles, .90 rate, 0.90 cent per ton per mile.

### Finished Iron.

185 miles, \$2.47 rate, 1.33 cents per ton per mile.  
93 miles, \$1.91 rate, 2.05 cents per ton per mile.  
58 miles, \$1.34 rate, 2.33 cents per ton per mile.  
128 miles, \$2.35 rate, 1.84 cents per ton per mile.  
170 miles, \$2.46 rate, 1.45 cents per ton per mile.  
52 miles, \$2.02 rate, 3.88 cents per ton per mile.  
26 miles, \$1.57 rate, 6.08 cents per ton per mile.  
20 miles, \$1.34 rate, 6.70 cents per ton per mile.  
29 miles, \$1.34 rate, 4.62 cents per ton per mile.  
250 miles, \$3.56 rate, 1.43 cents per ton per mile.  
175 miles, \$4.26 rate, 2.43 cents per ton per mile.

### Nails.

Miles.	Rate.	Per ton per mile.
49 miles, 8 cents per keg,	2.5 cents	per ton.
44 miles, 7 cents per keg,	3.0 cents	per ton.
135 miles, 10 cents per keg,	1.5 cents	per ton.
51 miles, 8 cents per keg,	3.0 cents	per ton.
37 miles, 5 cents per keg,	3.0 cents	per ton.
45 miles, 7 cents per keg,	3.0 cents	per ton.
62 miles, 10 cents per keg,	3.2 cents	per ton.
32 miles, 5 cents per keg,	3.0 cents	per ton.
126 miles, 10 cents per keg,	1.6 cents	per ton.
110 miles, 10 cents per keg,	1.8 cents	per ton.
75 miles, 10 cents per keg,	2.6 cents	per ton.

By way of contrast we give below some of the rates of freight from Birmingham and Chattanooga to the leading markets to which delivery is made by all-rail.

	Miles.	Rate.	Cent per ton per mile.
Birmingham, Cincinnati..	504	\$2.75	0.54
Birmingham, Louisville..	394	2.50	0.63
Chattanooga, Cincinnati..	335	2.25	0.64
Birmingham, Kansas City.	738	5.49	0.74

Here, then, we have a ton per mile rate which is lower by far than anything obtained in any part of the territory.

These figures, however, do not correctly measure the difference in the situation between Southern producers and Northern makers. Take a furnace in the Birmingham district. The open rate for the hauling of ore and coke, or coal, to the furnaces is 25 cents per ton within a radius

of 25 miles of Birmingham. Say that it takes 5 tons of ore, coke and limestone to make a ton of pig iron, which is liberal. Then the total freights which the ironmaster pays on all his raw material is \$1.25 per ton of product. Is there a single producer in Pennsylvania, New York or New Jersey who can show even double that figure? It is just to acknowledge that since Southern producers possess the advantage of proximity of materials they are entitled to all the benefits of it, but it will be considered just when producers in other sections demand that on long hauls of materials and on the transportation of product they be granted at least as low a rate per ton per mile as their rivals in other sections.

What can be expected of a management of a railroad like the Central of New Jersey, which in the face of the sharpest competition advances the rate from Lehigh Valley points to New England points from \$2.60 to \$3 on the 8th of April? A glance at a map will show how the distances compare between the localities named and the distance between Birmingham and Cincinnati, for which the rate is \$2.75.

The railroads commanding the territory from which Eastern iron manufacturers collect their raw material and which distribute their product must be told in the most emphatic manner that the days of bleeding a great industry are over. Unless they are prompt in doing justice, they will soon lose a business which has given them enormous revenues in the past and is still pouring very large sums into their coffers. Let any intelligent man visit the Hudson River Valley—travel along the Lehigh and the Schuylkill. He will witness signs of decay which, unless it is soon arrested, will leave among the wrecks only a few flourishing concerns, which the railroads have been unable to kill, which will live in spite of them.

The steel-rail trade surely needs every bit of encouragement which may be justly due it. For a long time no better news has been presented than the compilation, published last week by the *Engineering News*, bearing on current and prospective railroad construction east of Chicago and north of the Ohio River. It appears from the data collected by our contemporary that there are now under construction no less than 1677 miles of road, of which 426 miles are in Ohio, 392 miles in Pennsylvania, 307 miles in Indiana, 165 miles in Michigan and 152 miles in New York. When it is considered that in 1888 in all this territory the new mileage footed up to 858 miles, the progress making will be appreciated. It is true that so far as the rail mills and allied iron works are concerned, the doubling of last year's record does not amount to very much when compared with the tremendous falling off in the work west of the Mississippi River. But we know that the South is taking a good deal of construction material. Thus the *Engineering News* reports that in Kentucky 410 miles are under construction or contract. We believe that a notable feature of the work now going on throughout the country is that it is widely distributed among relatively small lines—a fact which may explain why the impression is easily created that there is less activity than is really the case.



### The Lake Superior Charcoal Pig-Iron Trade.

The winter through which we have just passed has been exceptionally mild, and as a consequence there was a remarkable absence of snow in many parts of the country. This was especially true of the greater portion of Michigan and Wisconsin. The fall of snow in that section was so light that not only were the operations of lumbermen seriously impeded, but furnacemen also found it a matter of much difficulty to secure a supply of wood at their charcoal kilns to carry them through the coming summer. Snow is essential for the economical transportation of wood any considerable distance through the forests of the North. Swamps also abound, and when they are not frozen they are practically impassable, compelling long detours by wagons, and thus greatly increasing the cost of charcoal to furnacemen who are obliged to rely upon that means of transportation in the collection of their fuel supply.

Considerable apprehension was manifested by the charcoal iron manufacturers as they saw month after month of mild weather pass by. The majority of them have contracts running over a large part of this year, and a curtailment of fuel or an advance in its cost is a matter of decided moment to them. The price of Lake Superior charcoal pig iron has also weakened to some extent in sympathy with the price of coke pig iron, and the prospect of low prices and dear fuel stretching out before the charcoal iron manufacturers is anything but pleasant. Then, again, the ore mining companies seem to have complete control of their product, and are determined to secure a better average price than they were able to get last year, so that the hope of relief in that quarter is quite slight. Unless the charcoal furnacemen are able to secure an advance on present prices, it would seem that before the approaching summer ends the old question of the survival of the fittest will again come up for practical solution. This view of the situation, of course, depends mainly upon two things: First, the maintenance of the present dullness in the iron trade, with a consequent slack demand, and, second, the deficient charcoal supply.

With regard to the former, it must be admitted that at present there is no decided indication of any change for the better. The railroads are buying cars and other supplies very sparingly, and the consumption of charcoal pig iron for car-wheels promises to be much less than normal. If other channels of consumption can be found to cover this deficiency it will be well for the manufacturers, but the probabilities are that this will not occur. With regard to the charcoal supply, we have instituted inquiries among the manufacturers in order to ascertain the exact situation at this time, since the winter is practically over and no more snow can be expected which will be of any service in hauling wood to the kilns. Replies have not been received as yet from all the furnaces, but enough information has been obtained to indicate quite a shrinkage in the tonnage of the current year as compared with the average of the past two or three years. Quite a number of furnaces will have all the fuel they need for a full year's run, either being advantageously lo-

cated for the collection of wood or having applied the most energetic efforts to secure a full supply during the short time when the weather was favorable. Some furnace companies who depend on contractors for their entire stock of charcoal regard the situation with complacency, as the anxiety about wood thus rests on others. The companies acknowledging a short supply of fuel are thus far few in number, though important in productive capacity, but more complete information will very probably swell this aggregate.

An important fact which has been brought out by our correspondence with the furnace companies is the curtailment of production to be effected this year aside from that caused by a short supply of fuel. This period of depression, slack demand and low prices will be made the opportunity to introduce improvements, remodel furnaces and accomplish other changes which would not be undertaken in a time of great activity and satisfactory profits. Several furnaces will each make from 2000 to 4000 tons less than they turned out last year. The supply may thus be reduced to the level of the demand, and even below it, in which case a reaction from prevailing low prices would not be surprising as the summer advances.

### Stimulating Our Export to South America.

On March 1, at a meeting in this city, a temporary organization was formed and a circular issued asking the co-operation of bankers, manufacturers, merchants, shippers and other interested persons in an effort to promote business with Spanish America and Brazil without Government help. The plan met with such favor that the permanent organization of an association was effected on the 29th of March with 500 New York members. The objects and aims of the new association are thus summed up: "To collect and group in convenient form facts and information relative to the national resources, means of communication, products of the soil, state of trade and finances, &c., with such practical suggestions as may be of service to our manufacturers and business men in general not having direct means of information. Also to co-operate with the members of the International Congress to the furtherance of the ends in view in such manner as may be in the power of the association, and to extend such civilities and hospitalities as are due to the representatives of those countries who take part in the proposed conference."

The movement is eminently well timed not only because it will furnish the International Congress valuable material, but because the general condition of things in South America, &c., was at no time more favorable to plans of commercial expansion in that direction. If we except Hayti, there is no revolution going on anywhere, and the high prices which coffee, sugar, wool, &c., have commanded in the world's markets for several years past have singularly enhanced the purchasing capacity of the populations down there. Brazil, the most important country, has got rid of the slavery incubus without a pang or disturbance, even without labor disorganization to speak of. Immigration is pouring into that country and the Argentine

Republic at the rate of 200,000 into each, this year. Our relations with Mexico, favored by the post-parcel convention, have received a fresh impulse. In Nicaragua we are about to commence digging a canal, which will in five years accomplish interoceanic communication, which has proved impracticable at Panama for a number of reasons which cannot hamper the American scheme. Nor is the Tehuantepec ship railway abandoned. The railways we have built in Mexico are there to testify to the value of a connection with our capitalists, and the States that are to congregate at the Congress in October are duly impressed with the importance of closer commercial ties with the Northern Republic, which in moral and material progress has been and is a beacon light to them.

The movement inaugurated is all the more promising in its scope since the Centennial was closely followed by a great and lasting impulse given to the export of domestic products. Then, as now, a feeling grew up that we should push this movement of increased exportation with energy. It was done, manufacturers and merchants taking a practical interest in the matter, and in a couple of years the value of domestic goods shipped in that direction had increased by one-quarter. At that time the movement was spontaneous, whereas now it will be a well-concerted effort under the guidance of our best men in trade and industry. Then ocean steamship communication was limited to our Mexican and Cuban trade, whereas now we ship per steamer all the way to Buenos Ayres.

We heartily approve of the movement, and wish it all the success it is entitled to. We shall conclude with noting the subjects which, in accordance with the act of Congress of May 24, 1888, are to be submitted for debate to the Congress of American Nations:

1. Measures that shall tend to preserve the peace and promote the prosperity of the several American States.
2. Measures toward the formation of an American Customs Union, under which the trade of the American nations with each other shall, so far as is possible and profitable, be promoted.
3. The establishment of regular and frequent communication between the ports of the several American States and the ports of each other.
4. The establishment of a uniform system of customs regulations in each of the independent American States to govern the mode of importation and exportation of merchandise and port dues and charges; a uniform method of determining the classification and valuation of such merchandise in the ports of each country and a uniform system of invoices, and the subject of the sanitation of ships and quarantine.
5. The adoption of a uniform system of weights and measures and laws to protect the patent rights, copyrights and trade-marks of citizens of either country in the other and for the extradition of criminals.
6. The adoption of a common silver coin, to be issued by each Government, the same to be legal tender in all commercial transactions between the citizens of the American States.
7. An agreement upon and recommendation for adoption to their respective governments of a definite plan of arbitration of all questions, disputes and differences that may now or hereafter exist between them, to the end that all difficulties and disputes between such nations may be peacefully settled and wars prevented; and
8. To consider such other subjects relating to the welfare of the several States represented

as may be presented by any of said States which are hereby invited to participate in said conference. The delegates to this conference on the part of the United States are to serve without compensation other than their actual necessary expenses.

The President has nominated the following delegates to represent the United States at the Conference of American Nations: John B. Henderson, of Missouri; Cornelius N. Bliss, of New York; William Pinckney White, of Maryland; Clement Studebaker, of Indiana; T. Jefferson Coolidge, of Massachusetts; William Henry Trescott, of South Carolina; Andrew Carnegie, of Pennsylvania; John R. G. Pitkin, of Louisiana; Morris M. Estee, of California, and J. H. Hanson, of Georgia. With such men actively identified with the proceedings important results may be expected.

### Commercial Development of Africa.

American schemes for the extension of trade with Africa have not met with that degree of success which the most sanguine had hoped for. Not many years ago a prominent New York merchant became quite enthusiastic respecting the prospects of Liberia, sending out sugar mills, encouraging coffee culture and aiding in the deportation of American negroes, but the so-called "Republic" now exists scarcely in name. In like manner a steamship project, which for a time engaged the fostering interest of several New York gentlemen philanthropically inclined, never took a tangible form, and passed out of mind. But a line of sailing vessels from New York to Liberia has been maintained, and American exports of manufactured cotton to Africa through various channels form a considerable item. Meanwhile England is building up a flourishing trade on both sides of the continent, on the West Coast and at Zanzibar. Trade with the colony of Lagos for the year 1887 amounted to \$4,500,000, and it is calculated that the entire trade of Great Britain with the West Coast last year amounted to an approximate value of \$25,000,000 of imports and \$13,000,000 of exports, comparing well with some portions of India. At Zanzibar, up to the recent breaking out of hostilities, the whole coast was a continuous line of British Indian trading stations, and trade increased rapidly to \$10,000,000 per annum, the greater part of this being in the hands of British subjects. "Unfortunately," as we are told by Archdeacon Farrar, "this property attracted the greed of certain German adventurers," who made "bogus treaties," claimed vast tracts of country and proceeded to take possession, despite the remonstrances of the Sultan. Furthermore, according to the authority just quoted, "the whole trade of the coast is in the hands of some 10,000 British subjects from India, including the ivory trade, copra, gum-copal, india-rubber, hide and grain trades. These British Indians have lent large sums of money to the Arab ivory caravans; they have also invested their profits in mortgages on the houses and plantations of the Arabs, feeling quite secure under the shadow of English justice. The British Indians have half a million sterling of floating capital employed at this time in the ivory trade in the far interior, and unless some decisive measures are taken by the English Government

this large sum must inevitably be lost." England appears to have become inextricably involved by joining in an agreement with Germany to maintain a blockade "to put down the slave trade," a feat somewhat difficult of accomplishment where every African and Arab trader is a slaveholder either in will or deed. Clearly enough, it would now appear the "development of Africa," whatever this may mean, has received a check from which there will be tardy recovery. It is surmised, however, that traders in Zanzibar, while postponing indefinitely the realization of hopes for the commercial subjugation of the interior lake regions accessible from this point, may give a new impetus to the Congo Free State and to efforts to penetrate tropical Africa through the Soudan. The marvelous achievements of Livingstone's successor, Henry M. Stanley, of whom full advices have just come to hand, invest the subject with a new interest.

The annual report of the Colorado Coal and Iron Company for the year ending December 31 says: While the results for the past year have been unsatisfactory, owing to the demoralization of railroad rates at points east of Colorado, which enabled shippers of steel, iron and coal to invade territory that naturally should be supplied from Colorado, we hope and believe that, with adjusted rates outside of this State, with improved business conditions, the change of management and economies which it is proposed to enforce, the results for the next year will be much more gratifying. The following is a condensed statement of the result of the year's operations as compared with the previous year:

	1888.	1887.
Gross earnings, including interest from investments and interest discount and exchange account.....	\$2,219,047.99	\$2,822,529.61
Cost of production and manufacture, including taxes, insurance and royalties.....	1,863,605.89	2,270,296.19
Net earnings.....	\$355,442.10	\$552,233.42
Deduct interest on bonded debt (two coupons).....	209,940.00	209,940.00
Surplus for year....	\$74,502.10	\$342,293.42
Royalties earned and charged in above expenses.....		\$96,245.39
Sales of real estate for the year amounted to.....		128,341.61

Representatives from Western Territories who are now in Washington represent that much injury results from the exclusion of foreign capital, naturally checking investment in mining property. They urge that the act passed by Congress in 1887 to restrict the ownership of real estate in the Territories to American citizens has been found to be a grave mistake so far as mining property is concerned. The reasons for the passage of the act applied entirely to agricultural lands and were based upon the fact that large areas of such lands were purchased and held by aliens, whereas the mines in the Territories are mostly situated in high mountain ranges, on land unfit for agriculture or any other use except mining. The amount of capital invested by aliens in mines in the Territories, according to the investigations of a Senate committee, amounts to \$20,573,750, and the dividends paid thereon as far as known to about \$4,737,800. It was impossible for the committee to ascertain the gross product of the mines developed by alien capital, but it reached the conclusion that the mines worked by aliens on an investment of \$20,503,000 have produced not less than \$50,000,000, the greater portion of which has been expended at home for labor, machinery, &c.

### Special Iron Freights from the South.

The Southern Railway and Steamship Association have fixed the following rates of freight on the articles named, taking effect on the 1st inst.: Iron, architectural, including columns, pedestals, capitals, plates, saddles, door and window jambs, sills and lintels, rolled beams, channel-bars and girders; bar, band, boiler and plate iron or steel, all unpacked; bolts, nuts, rivets, staples or washers, in kegs, casks or drums; bridge iron; carriage and wagon axles; carriage or wagon skeins and boxes, packed in kegs, barrels or casks, released; car wheels, axles and trucks; castings, not machinery, each piece weighing 200 pounds or over, not packed, owner's risk of breakage; chains, in casks or barrels, value limited to 2 cents per pound, and so specified in bills of lading; crow-bars; cut nails and spikes, in kegs; fence posts; fence wire; fish bars, fastenings and steel-rail braces; horse and mule shoes; jail plates, mat-tocks and picks, in bundles or barrels; pipe, cast or wrought, released; pipe fittings, in kegs, casks or barrels; pipe fittings, wired, in bundles, C.L. only; plow molds, plow plates, plow points, plow steel and plow wings; railroad iron; sad irons, in barrels or casks, released; sad irons, in boxes, contents to be plainly marked on boxes and contract to be made by the shipper that no other articles shall be put in the boxes; sash weights, unpacked; wagon tires; pig iron, L.C.L. only.

Per 100 Pounds.

To	From Birmingham, Ala.		From Chattanooga, Tenn.	
	L.C.L.	C.L. Not less than 30,000 lbs.	L.C.L.	C.L. Not less than 30,000 lbs.
Akron, Ohio.....	29	22	26	20
Allegheny, Pa.....	31	24	28	22
Atchison, Kan.....	42	38	42	38
Atlanta, Ill.....	31	24	28	22
Aurora, Ill.....	31	24	28	22
Aurora, Ind.....	20.8	16	17.8	14
Bellaire, Ohio.....	30	23	27	21
Bellefonte, Ill.....	18	14	17	13
Belmont, Mo.....	16	12	14	11
Bloomington, Ill.....	30	23	27	21
Bridgeport, Ohio.....	30	23	27	21
Cairo, Ill.....	16	12	14	11
Chicago, Ill.....	31	24	28	22
Cincinnati, Ohio.....	16	12	18	10
Cleveland, Ohio.....	29	22	26	20
Columbus, Ky.....	14	11	18	10
Columbus, Ohio.....	25	20	22	18
Danville, Ill.....	29	22	26	20
Dayton, Ohio.....	23.5	18.5	20.5	16.5
Detroit, Mich.....	30	23	27	21
East Cairo, Ky.....	14	11	13	10
East Saginaw, Mich.....	32	25	29	23
East St. Louis, Ill.....	18	14	17	13
Evansville, Ind.....	16	12	14	11
Fort Wayne, Ind.....	27	21	24	19
Greencastle, Ind.....	25	20	23	19
Grand Crossing, Ill.....	31	24	28	22
Hamilton, Ohio.....	21.5	16.5	18.5	14.5
Hegewisch, Ill.....	31	24	28	22
Hillsboro, Ohio.....	23.5	18.5	20.5	16.5
Indianapolis, Ind.....	25	20	22	18
Jacksonville, Ill.....	31	24	28	22
Jeffersonville, Ind.....	17	14	16	13
Kansas City, Mo.....	42	38	42	38
Lafayette, Ind.....	27	21	24	19
Lawrenceburg, Ind.....	20	15.5	17	13.5
Leavenworth, Kan.....	42	38	42	38
Lima, Ohio.....	26	20	23	18
Louisville, Ky.....	14	11	13	10
Mansfield, Ohio.....	27	21	24	19
Mattoon, Ill.....	27	21	24	19
Memphis, Tenn.....	12	9	12	9
Mendota, Ill.....	31	24	28	22
Miamisburg, Ohio.....	23.5	18	20.5	16
Nichols City, Ind.....	31	24	28	22
New Albany, Ind.....	17	14	16	13
Newark, Ohio.....	25	20	22	18
Newport, Ky.....	16	12	13	10
Peoria, Ill.....	31	24	28	22
Pittsburgh, Pa.....	31	24	28	22
Sandusky, Ohio.....	29	22	26	20
South Bend, Ind.....	31	24	28	22
Springfield, Ill.....	31	24	28	22
Springfield, Ohio.....	24.5	19.5	21.5	17.5
Steubenville, Ohio.....	30	23	27	21
St. Joseph, Mo.....	42	38	42	38
St. Louis, Mo.....	18	14	17	13
Terre Haute, Ind.....	25	20	23	19
Toledo, Ohio.....	23	22	26	20
Wheeling, W. Va.....	30	23	27	21
Wyandotte, Mich.....	30	23	27	21
Zanesville, Ohio.....	27	21	24	19

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 2, 1889.

The disaster to the American fleet at Samoa has placed before the Government and people in its baldest form the utter weakness of the nation as a naval power. The loss of the three best vessels of their class has put the Government to the worst straits to find vessels to take the place of those lost. This sudden demand has demonstrated the inefficient methods of the naval administration. The tardiness of Congress, while one cause, is not the sole reason for the delay. The four steel protected cruisers which created so much commotion when Secretary Whitney took hold of the department, after four years are in commission, but have not all received their full batteries. The Baltimore, Yorktown, Charleston and Vesuvius are afloat, but without their means of offense and no prospect of receiving them very soon. The greatest difficulty lies in the tardiness in the manufacture of the guns. The work on the vessels fixed by contract is going along satisfactorily, but without batteries they are useless to the Government. The effect of the Samoan experience will be felt when Congress again assembles. The President in his conversations on the subject has indicated his determination to recommend a comprehensive system of naval construction and coast defense, by means of floating steel batteries, torpedoes and other appliances which will place the Government on a plane with any nation on the sea, and make its security against attacks from without practically perfect.

There is no doubt whatever that the legislation of the next session of Congress, which is most likely to assemble in October in order to hasten matters affecting the navy and the revision of the tariff, will be the most important in the entire history of the Government. The stimulus given to the demand for iron and steel will quicken every branch of industry and bring the country up to the highest possible activity in production and trade. Secretary Tracy is also very emphatic in his opinions concerning the necessity of a vigorous and liberal policy concerning the rebuilding of the navy and will make that a leading feature of his recommendations to the President in his first annual message.

The work on the vessels still building will now be pushed with increased vigor. All the material to complete them is on hand. The latest reports from the Maine, building at New York, state that her keel is in place and the stern post is ready. The work of construction will, therefore, begin in earnest very shortly. The Texas, the other armored vessel, of huge size and offensive and defensive power, has not yet been commenced. The blocking, however, is ready. The specifications for the additional vessels authorized by the late Congress are being prepared. Those for the coast defense vessel are completed and bids will be received. It is not determined whether there will be any change in the standard of tests for the new vessels. The Board of Steel Inspection have completed a tabulated statement of results of tests which is being bound in manuscript. Whether it will be printed is a question for the Secretary to determine. The data at present is regarded as confidential. In a general way it can be stated from an examination of the data that the material turned out for the ships under construction is of the highest quality in physical characteristics.

The gun and armory plant of the Bethlehem Iron Works is now fairly at work. A number of 8-inch guns will soon be under way; an 8-inch tube is now being pre-

pared. The manufacture of modern guns is a slow process and the plant will, therefore, be worked to its full capacity. It was stated by a naval authority that to carry a single gun through all the stages of manufacture, from the casting of the tube to mounting ready for service, requires about a year, but that 10 guns or a number up to the full capacity of the plant would take no longer. The Department is now considering the subject of arranging a schedule of guns required by the vessels under construction, proposing to have the batteries ready as the ships are in condition to receive them. It is proposed to begin at once the manufacture of 16-inch guns.

### Electric Street Railways.

In nearly all our large cities and in many of the smaller towns electric propulsion is attracting widespread attention. Some facts of considerable interest were given not long since by George W. Mansfield, in the course of an address before the New England Club at Boston, from which we take the following:

In the year 1880 Thomas A. Edison made an early experiment of great practical value in Menlo Park. He carried on his researches to a certain extent, and then abandoned them. He demonstrated, however, its practicability. In 1888 Leo Daft, of Jersey City, made quite an important experiment on the Saratoga Railway. He had a motor of 20 horse-power made, and this he attached to any ordinary car and towed it over a mile or two on the above track, and this was the very first electrically propelled car upon a steam road. About the same time an experiment was made which was a commercial success. This was in the Chicago Exposition by Stephen Field. He used a United States machine and had a circular road constructed on which he carried 80,000 passengers. After that there were similar undertakings at different fairs throughout the country. In 1885 and 1886 there was a small motor running at the Point of Pines, at the Mechanics' Fair, and also one in New Orleans which carried 30,000 to 40,000 passengers.

From these small trials made at different fairs and with a view to interesting the world, have sprung the magnificent developments which are taking place on every hand to-day. The first railway in this country equipped for commercial purposes is said to have been at Baltimore. This was made by the Daft Company, and was put in regular service. It has been in operation continually ever since. As the electrical engineers of to-day look upon that road, only three years old, they marvel how it is possible for a system so crude and unscientific to be operated at all, for more powerful and richer companies taking hold, wonderful progress has been made. Over 300 miles of electric railways are now in regular operation or in process of construction. There are in the neighborhood of 850 to 400 cars running in daily service. Hundreds of thousands, in fact millions, of people are being carried on these cars to-day. It is almost impossible to get at the correct figures in regard to the magnitude of the business. The various companies are constructing tracks as rapidly as possible, yet they cannot keep up with the demand made upon them. The Sprague Electric Railway Company have nearly 30 contracts in hand, and are almost compelled to refuse contracts offered them. It is the same with the Thomson-Houston Company. To give you some idea of the magnitude of the business we are now considering, I would like to present you a few figures representing the number of passengers carried in this country. I was perfectly astonished myself at what I found in the way of figures. In Massachusetts

there are 67 steam railways, having a total mileage of about 5300 miles. Their passenger cars ran during the year 1887 about 15,000,000 miles, and carried 89,000,000 passengers.

Now, take the street railways of Massachusetts, and there are 44 companies instead of 67. They operate only 507 miles of road as against 5300 miles operated by the steam railway companies, and yet made a car mileage of 20,000,000 of miles through the streets, and carried 124,000,000 of passengers as against 89,000,000 carried by the steam railways. This shows that the street railways of that State do a greater passenger business and are a most important factor in our cities and towns. You cannot go into any State in the Union but you find pretty much the same condition of things existing. Unfortunately, in the Western States they do not publish railway reports as they do in the East, so it is difficult to obtain accurate figures in these matters.

Taking the United States census reports I discovered that in 1887 on 151,000 miles 269,000,000 of passengers were carried on the steam railroads of the United States. What are the reports of the business done on street railways? They show a magnitude which is almost astounding. Mr. Moody Merrill and others furnish figures which show that there 3500 miles of street railways, and they carried 1,500,000,000 passengers, so that with a vastly smaller mileage than the steam railway companies have, the street cars carried in the neighborhood of five times more passengers. It is the object, then, of the electric railway profession to so facilitate these methods of transporting the people from point to point in the various cities and towns that these figures will sink into insignificance. The Boston company alone carries over 100,000,000 annually. New York carries 225,000,000, about as many as all the steam roads in the United States. You see, then, the electrical profession has a great problem before it, and it thinks it can solve it. The next problem will be a similar one, and that is the transportation of passengers upon the present steam roads.

Coming now briefly to the different methods of applying electricity to street-car service, there are in all, fundamentally, only three. The first we may mention is the storage; secondly, the overhead system, and, thirdly, what is called the underground or conduit system. The storage battery consists essentially of a chemical battery placed on the car and charged with electricity. This electricity is chemically liberated to drive the motor. It is hardly to be believed that any form of storage battery or any form of a battery will ever be successfully applied to a very large extent to street-car propulsion. Chemistry and chemical action cannot compete with mechanical action and the consumption of coal in cheapness, positiveness and economy. In the overhead system, then, we have to fall back on the power station. We have our engine placed at one particular place; this imparts motion to the armature of the dynamo, and this motion, generating the electricity, is transmitted through the street by the overhead wire to the motors on the cars, and there is changed back to mechanical motion. We have then to transmit electrical energy, or, primarily, the steam energy, to the street cars. There is usually only one wire stretched over the street, and this may be suspended along the center or on one side, according to the location of the tracks; it makes no difference how this wire is supported. It is simply a question of mechanical ingenuity and practical expediency. In Washington the Thomson-Houston Company recently put a line of poles in the center of the street for supporting the wire. It has been a pronounced success. I have been of opinion for the last two or three years that this

method is going to be permanent. It presents fewer obstructions and is neater in appearance; on every third or fourth pole may be placed lights for illuminating the street. In Washington they have macadamized the streets, so that with the form of rail used and the line of poles in the center of the streets 120 feet apart, and lights on every other pole, you have a thoroughly scientific street. In New York City poles and wires are said to be both an obstruction and a danger. The public is against them. Could they live without them? In every town there are times when questions of aestheticism and beauty must give way to practical utility and commercial activity. The public now demands better transportation facilities. What will they tolerate for these facilities? We will do the best we can, but if mechanics and science demand the use of poles, can we not use them?

The conduit system will soon be exemplified here in this city, connecting with the Brookline overhead system. The conduit will be laid from Ipswich street up to the Providence Depot, and eventually up to Park Street Church, if not, indeed, all over the city. Both systems are thus to be practically tested. The Thomson-Houston Company are vigorously pushing the equipment of the Cambridge line with the overhead system. It will extend from Bowdoin Square to Harvard Square, Cambridge, and thence to Arlington. The production of enough electricity is a plain mechanical problem. There are stations in this country already producing 2000 and 3000 horse-power.

Now, the benefits to be derived from the application of electricity to street cars are many, and a careful examination of the matter discloses so many advantages that the wonder is how and why the electrical profession should encounter any opposition from the city aldermen or the community at large. The first benefit I might mention is the relieving of certain congested portions of the city. This is one of the most serious problems confronting every large city in the world. There are portions of every city whose people are so crowded and crammed together that crime grows apace; a stagnant pool of iniquity is formed. Project a rapid transit electric line through this locality. Take the people out into the country, illuminate the streets—must not crime cease? The question of rapid transit is also an all-important question of the day; the people want to get home quickly and comfortably. All want seats; tired nature asserts herself at 6 p.m. An electric car can be easily provided with such an abundance of power that at certain hours of the day other cars can be attached to it; and it is proposed on the Cambridge line that each one shall have sufficient power to tow two or three cars after it, so that every person will be accommodated going to or returning from the city.

Another question is the cleanliness of the cars and the streets. In New York over \$1,000,000 are annually spent in cleaning the streets, and you can readily see here in Boston that if 9000 horses can be removed the appropriation for cleansing the streets can be materially reduced. Other points are the elimination of the noise, the more pleasant means of transit, stopping the cars quickly and readily, starting promptly and without any jerking, and the saving of our sympathies. In Omaha, Neb., we have started a road nine miles long where we have introduced a new feature. There we have in operation a vestibule train in the streets. The cars are constructed by the Pullman Company and the platforms are provided with the latest vestibule arrangement, which renders traveling very comfortable. It is not too much to say that possibly the day is not far distant when there may be a dining car running on the Chestnut Hill

line and the Cambridge line, so that gentlemen working hard in the city can enjoy a little refreshment on their way home, which will be a great convenience.

And now let me say in concluding these remarks that President Whitney deserves the credit beyond any word that I can express for what he has determined to accomplish. That gentleman has investigated all the known methods of propelling street cars; he has spent tens of thousands of dollars in these investigations, and he has ultimately pinned his faith to electricity, and his faith will be proved not to have been misplaced. He is putting into the streets of Boston perhaps 15 or 20 miles of electric roads. He has now in operation altogether 212 miles; therefore he has begun on a generous and large scale a determined effort to solve this question in the interest of the traveling public of Boston. I know, too, that all the electrical engineers in Boston are putting forth every effort and are joining hands and bringing into active service all the talents and abilities that the whole electrical world can produce in aiding him. Success is positive. All praise to President Whitney. The world will thank him in years to come. For my part, I feel that the question of propelling every street car in the city of Boston is a question of a very short time. We cannot say that two or three years is a short time in electrical matters; we cannot say that one year is a long time. It is only in the neighborhood of ten years ago when the telephone was first brought out, and there is not a gentleman in this room but who has used the telephone and appreciates its value. To-day there are 150,000 miles of telephone wires strung, and men are talking from Boston to New York more easily than I am talking to you. In doing that an electric current is being used of so small an amount that electricians have as yet been unable to measure it.

There are other magnificent electrical applications now coming forward, and I do not think that any man to-day who has any acquaintance with the electrical development of the last five or ten years can say or feel, with justice to the profession and the advancement of the art, that there is any doubt or question as to the speedy solution of the problem of street-car propulsion by the electric current and electrical appliances.

A lamentable occurrence took place last week at the four-story brick factory on Kent avenue, Brooklyn, occupied by Dillmeir & Staatz as a brass foundry, Frederick Wurster, manufacturer of axles, and several others. Oil accidentally ignited, and, spreading to the stairway, the hands employed above were compelled to leap from the windows to save their lives. Several were fatally injured and one man was burned to death. John Lynagh, the building inspector whose duty it was to see that there were fire-escapes on the burned building, and who neglected that duty, says in self-vindication: "I being engaged in the yearly examination of public buildings, factories, &c., and my district being a large one, I failed to reach the building burned on the 26th inst., but I had already made memoranda of the same for an inspection to be made the latter part of this week." The inspector, unfortunately, was too late.

It is stated that a traveling electric light has come into use in Germany. It somewhat resembles the steam fire engine, the tank, boiler, engine and dynamo being mounted upon a wagon, which can be drawn by a team of horses to any desired location. When the apparatus reaches its destination, arc lamps are raised upon poles stayed with wires fastened to stakes driven in the ground. The whole plant is simple, and stated to work satisfactorily.

### Fluctuations in the Gauge of Plates.

Modern requirements for ship and boiler purposes often call for heavy plates; with them the fluctuations in the thickness are often greater than with ordinary plates. In order to secure accurate data on the extent of these variations three German plate mills, Schulz-Knauddt, of Essen; Grillo, Funke & Co., of Schalke; and Fried. Krupp, of Essen, made a series of measurements. The thickness was calipered as close to the edge as possible at a number of points. The weight was used to calculate the thickness, using 7.76 as the specific gravity. The following table gives the results:

#### Gewerkschaft Schulz-Knauddt, Essen.

Length. Millimeters.	Width. Millimeters.	Minimum thickness. Millimeters.	Maximum thickness. Millimeters.	Weight. Kilograms.	Calculated thickness.
4005	1601	8.2	8.8	436	8.76
5110	1604	15.5	16.4	1097	16.29
3980	1605	12.8	13.4	665	13.48
3431	1603	9.8	10.5	463	10.46
2568	1765	12.1	12.6	445	12.64
2634	1770	9.9	10.6	390	10.77
5091	1886	10.0	11.2	848	11.38
2563	1933	11.9	12.7	496	12.64
6815	1978	16.2	17.2	1804	17.26
2430	1983	10.8	11.7	441	11.79
3201	2062	13.7	14.5	745	13.80
3368	2104	11.9	13.4	732	13.81
2502	2189	11.0	12.0	517	12.06
2721	2264	11.4	13.25	699	13.36
2722	2264	11.65	13.35	642	13.43
4197	2380	11.2	12.3	945	12.19
3204	2417	9.8	11.45	676	11.24
3287	2507	9.3	10.8	675	10.71
3550	2560	11.0	12.7	877	12.43
Round	2608	21.7	22.95	965	23.35
Round	2604	22.0	23.0	970	23.44
2639	2632	10.4	12.2	654	11.90
2637	2637	10.0	11.5	629	11.65
2789	2685	10.7	12.8	716	12.83
2789	2690	10.45	12.6	709	12.17
Round	2809	24.8	26.25	1254	26.07
Round	2813	24.1	25.15	1238	25.66
3841	3008	13.65	15.2	1328	14.76
3840	3006	12.7	15.2	1323	14.76
3843	3007	12.3	14.55	1270	14.16

#### Gewerkschaft Grillo, Funke & Co., Schalke.

2083	1102	18.9	19.30	310	19.17
2708	1103	11.70	12.54	286	12.33
2707	1104	11.10	11.68	269	11.59
2708	1104	11.68	12.33	283	12.19
2707	1105	11.92	12.79	293	12.58
2705	1109	11.68	12.79	296	12.70
1975	1165	9.93	10.84	188	10.53
1976	1169	9.83	10.72	188	10.49
2984	1171	11.96	12.64	297	12.42
4061	1172	13.95	14.51	526	14.30
1965	1174	10.20	10.74	189	10.55
4063	1175	14.18	14.83	531	14.65
2611	1410	13.16	14.30	404	14.14
4068	1581	13.8	14.75	727	14.51
4078	1581	14.20	14.87	737	14.72
4079	1583	13.9	14.55	721	14.39
4069	1586	14.5	15.25	757	15.05
4063	1599	14.0	14.92	745	14.79
2538	2184	18.30	18.95	805	18.70
2541	2186	18.15	19.21	810	18.78

#### Friedrich Krupp, Essen.

4232.5	1007.0	6.9	7.1	228	6.89
4233.5	1007.0	6.65	6.9	225	6.71
4231.0	1228.5	5.4	5.7	222	5.50
4251.0	1246.5	5.4	5.8	232	5.64
3671.0	1247.5	5.6	5.9	208	5.85
3050.5	1250.5	4.7	4.9	147	4.96
3054.5	1251.0	4.8	5.0	146	4.91
3030.5	1255.5	4.75	5.0	150	5.03
3058.0	1255.0	4.7	5.05	145	4.80
3057.5	1256.5	4.8	5.1	153	5.10
3058.5	1258.5	4.55	4.9	146	4.88
3646.5	1407.0	6.15	6.7	260	6.53
3642.0	1408.0	6.0	6.35	248	6.25
3633.5	1409.0	5.9	6.15	244	6.14
1705.0	1606.5	17.15	18.1	397	18.19
2209.0	1708.0	19.4	20.55	598	20.41
2205.0	1709.0	19.34	20.32	593	20.27
3240.0	1726.0	12.2	13.5	525	13.03
2780.0					
3580.0	2804.5	14.0	16.6	1233	15.82
3582.5	2808.5	13.0	15.8	1185	15.17

It will be observed that the variations are considerable. Our contemporary, *Stahl und Eisen*, adds that they often astonished the managers and engineers of the works



# TRADE REPORT.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 2, 1889.

The first quarter of 1889 has been a very trying time to the Iron trade, and, although prices show some slight tendency to react from the lowest, they are, nevertheless, from 50¢ to \$1 lower in Pig Iron and from \$2 to \$3 on Finished Iron than they were during the corresponding week three months ago. The volume of business has been large, but competition with Pig-Iron makers in the South and with Steel manufacturers in Pittsburgh, has kept prices weak continually, and it is not yet clear that the turning point has been reached. The increase in capacity for production seems to be the chief cause of the unprofitable condition of business, so that an improvement can only be the result either of a curtailment in the output or an increase in the demand. The former alternative has been forced upon some, and it is hoped that the latter will do the rest. Matters are two unsettled to warrant very positive predictions for the near future, although it will be contrary to former experience if an improvement does not come within the next few weeks. Many well-informed persons think it will be both sudden and decisive; a start is all that is required.

**Pig Iron.**—No change can be noted in this department. The demand is sluggish, but the supply appears to be steadily absorbed, and there is more pressure to realize to-day than there was three or four weeks ago. Prices average about the same, although there are instances in which slight advances have been paid, while in other cases buyers have had the advantage. Price depends a good deal on what the Iron is and what the buyer wants. To offer a new brand, or a brand not in favor, means concessions from quoted rates, while an inquiry for quotations on standard qualities is at once met with a firm response. There is nothing in sight at present to indicate any change in the position, although very little would do it. An increase in the demand would be likely to develop a firmer market at once, while on the other hand a pressure to realize would just as quickly have the opposite effect. It is impossible to say which of these influences will be developed, although the chances seem to favor the former alternative. Prices are already much below what they ought to be, foreign markets are steadily advancing, and the season is at hand when consumption ought to be at its maximum, so that, with favorable crop prospects and a sound financial position, it is not unreasonable to expect a better market in the near future. Nevertheless, the trade are very conservative. Recent experience has shown consumers that they have not lost anything by taking small lots, and until their requirements increase it is hardly likely that they will take larger lots. Sellers are very much in the same position. Sales made in January were on better terms than could have been secured later on, but there is no certainty that sales of large lots for such prices as could be realized to-day would be equally satisfactory a month or six weeks hence. This feeling decides both parties to sail close to the wind, so that the turn, whenever it comes and whatever direction it takes, is likely to be a very decided one. As to prices, sales of No. 1 Pennsylvania Irons are reported at all the way from \$17.50 to \$18.50; No. 2 at \$16.50 @ \$17, and Gray Forge at \$15 @ \$15.75, all tide-water deliveries, price according to brand, &c. Southern Irons are not selling very freely, although offered at from 50¢

to 75¢ below the local brands. The truth is that buyers are not inclined to take hold, and as efforts to push sales would be likely to weaken the market without increasing the volume of business holders are inclined to wait until satisfactory bids are presented for their consideration.

**Blooms.**—There is the usual movement in Blooms, and without change in prices. Sales are chiefly at quotations about as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 @ "Bloom" ton of 2464 lb.

**Muck Bars.**—A better demand has been met with during the past week, but no great amount of business done, as sellers' ideas are a little beyond what buyers are prepared to pay. Asking prices are from \$27 to \$27.50, delivered, for good Bars, with buyers at not much over \$26.50 for good-sized lots.

**Bar Iron.**—Business is extremely dull, with prices about as low as they have been at any time during the recent depression. There is a fair jobbing trade, but no demand for large lots, so that none of the mills are running more than from a half to two-thirds of their capacity. The prospect is not encouraging for an immediate improvement, although manufacturers are still hoping for a turn in their favor. There should be a good demand at this season, but there are so many on the lookout for new business that prices hardly have a chance to stiffen. It is impossible to quote such a market with strict accuracy, but from 1.70¢ to 1.80¢ seems to be both top and bottom, varying according to size of order, specification, &c. Skelp Iron is nominally about 1.75¢ for Grooved and 1.85¢ for Sheared, but there is no demand of any account at present.

**Plate and Tank Material.**—Business is not active by any means, but mills are all fairly employed for the present. Prices are very weak, however, and it seems impossible to secure orders of any size without cutting prices; in some descriptions a half-tenth, and in higher qualities a tenth, and sometimes more than that. The fact is, the market is drifting along in a most unsatisfactory condition, and it is impossible to say how long or how short a time it will so continue. Prospects are favorable as regards the volume of business, however, and ultimately that, of course, will have its effect upon prices. Meanwhile, quotations are nominally as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 3¾¢.

**Structural Material.**—Nothing very important has been placed on the market within the past few days, but it is understood that a large amount work has been virtually agreed upon. The material may not be wanted immediately, but the business is definitely in sight, so that the feeling is more hopeful than in some other departments of the Iron trade. Prices are very irregular, nevertheless, and cuts in Angles appear to be the rule rather than the exception when the order is desirable as to size or specification. Nominal rates are as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet Iron.**—Business is not what it ought to be at this season, although specialties are in good demand. The ordinary demand, however, is disappointing, notwithstanding the fact that some of the

mills are running full in anticipation of a better market later on. Prices are usually about as follows:

Best Refined, Nos. 14 to 20. .... 3¢  
Best Refined, Nos. 21 to 24. .... 3.20¢  
Best Refined, Nos. 25 to 26. .... 3.40¢  
Best Refined, No. 27. .... 3.50¢  
Best Refined, No. 28. .... 3.60¢  
Common, ¼¢ less than the above.  
Best Soft Steel, Nos. 14 to 20. .... 3½¢  
Best Soft Steel, Nos. 21 to 24. .... 3¾¢  
Best Soft Steel, Nos. 25 to 26. .... 3¾¢  
Best Soft Steel, No. 27. .... 4¢  
Best Bloom Sheets, ¼¢ extra over the above prices.  
Best Bloom, Galvanized, discount. .... .65 %  
Common, discount. .... .67½ %

**Steel Rails.**—There is a remarkable sameness in reports from week to week. Prices are maintained at about \$28, at mill, and, while no large orders are taken, the mills seem to be fairly busy on such business as comes to hand from day to day. The impression is that the market will be better, and that prices will be higher before many weeks are over, as a great deal of business is likely to be on the market before midsummer.

**Crop Ends.**—There is some inquiry for foreign Crops, but prices appear to be too high to permit of business being done. Domestic Crops are offered at \$19 @ \$20, at mill; foreign, \$22 @ \$25 asked, according to analysis.

**Old Rails.**—There is very little demand, but the scarcity of spot lots enables holders to maintain their prices. Buyers talk about \$23 for T's, with sellers at \$24 @ \$24.50 for lots delivered in consumers' yards. No sales have been made in this market for some time past, quotations at other points being more favorable to buyers.

**Scrap Iron.**—There is a moderate movement at interior points, but prices are easier, and to effect sales concessions would have to be made. Prices nominally as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The market has a better appearance, and prices are well maintained. Discounts about as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

**Nails.**—The same monotonous report must be repeated, prices irregular and unsatisfactory, although the demand is improving. A meeting of the association is to be held on Thursday, when it is hoped that measures will be adopted to secure legitimate prices for Nails.

## Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, April 1, 1889.

The passage of the first quarter of the year has brought with it no promise of the speedy recovery of the Iron trade of this section from its depression. At times during the past three months decided activity has been witnessed in nearly every branch, but the movement was only spasmodic, being followed by a relapse into dullness which seemed more profound in contrast with the brief season of animation. Prices are at cost or below it with respect to most commodities, and the hope of an advance is but slight, even with the most sanguine, so long as present conditions prevail. Railroads are economizing in their purchase of supplies more than ever before in their history, and as this is the headquarters of more large railroad systems than any other city in the country, the effects of their enforced economy are more

severely felt here than elsewhere. The railroad situation must improve, and that very decidedly, to restore the Iron trade of this district to its normal condition. The second quarter of the year opens with very gloomy prospects for those who are struggling with high costs, low prices and narrowing channels of consumption.

**Pig Iron.**—Dealers generally found the past week very quiet, but few sales being reported, and those mainly to country consumers. Among the sales were included a considerable quantity of Soft Iron and some Lake Superior Charcoal, but local Coke Iron keeps in the lead. Prices are not firmly maintained, the supply being much in excess of the demand, and it seems absolutely necessary that the production should be speedily curtailed if makers do not wish to see prices on a still lower plane. Cash quotations are about as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, \$17 @ \$17.50; Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, all numbers, \$19.50; American Scotch (Blackband), No. 1, \$18 @ \$19; Jackson County Silvery, No. 1, \$18 @ \$18.25; other Ohio Soft Irons, No. 1, \$17.25 @ \$17.50; Southern Coke, No. 1 Foundry, \$16.25 @ \$16.75; No. 2 Foundry and No. 1 Soft, \$15.75 @ \$16; No. 3 Foundry, \$15 @ \$15.50; Gray Forge and No. 2 Soft, \$14.50 @ \$14.75; Tennessee Charcoal, No. 1, \$19.

**Bar Iron.**—Bids have been asked on Car Iron to some extent, and consumers generally have purchased small quantities of Iron, but there has been no approach to anything like activity. Some of the mills have been able to get good prices on guaranteed Iron, for delivery during the summer, but in other respects there has been no change, mill lots of Common Iron being still quoted at 1.60¢ @ 1.65¢, half extras, f.o.b. Chicago. Small lots are sold from store at 1.80¢ @ 2¢, according to quantity and quality.

**Structural Iron.**—Orders for Beams are increasing in volume, and the advance of the building season is also bringing a demand for Plates and Angles to be used in structural work, but bridge material is not called for to any extent. Mill lots are quoted as follows, f.o.b. Chicago: Angles, 2.15¢ @ 2.25¢; Sheared and Universal Plates, 2.20¢ @ 2.30¢; Tees, 2.55¢; Beams and Channels, 2.90¢. Small lots from store are quoted as follows: Angles, 2.80¢ @ 2.50¢; Tees, 2.75¢; Beams and Channels, 3¢ @ 3.40¢.

**Plates, Tubes, &c.**—A quiet week is reported in this branch, with no orders in the market of any notable magnitude. The active trade of the previous weeks, however, made the result for the month exceedingly good, notwithstanding the dullness of the closing days. Store quotations are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; No. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 65 % off for 3 inch and over, 62½ % off for 2 to 2½ inch, and 57½ % off for 1½ inch and smaller.

**Sheet Iron.**—The mills still seem to be very loth to take orders for summer delivery, but quote about 2.90¢, f.o.b. Chicago, for No. 27 Common, immediate shipment. The call for small lots from store is very light, with quotations of No. 27 at 3.10¢ @ 3.20¢.

**Galvanized Iron.**—Manufacturers' agents report March one of the heaviest months they have ever had, their sales far exceeding those of March, 1888. The rush is about over, however, the demand for mill lots and for small lots from store

having been limited in the past few days. Small lots still sell at 65 % off for Juniata and 65 % and 2½ % off for Charcoal.

**Merchant Steel.**—A continued improvement is noticeable in this line, but only in a retail way. No heavy transactions are reported, and no large orders are in sight, but the character of the trade indicates a general stocking up throughout the section of country drawing supplies from this city. Quotations are about as follows: Soft Steel Bars, 2.20¢ rates; Tool Steel, 7.75¢ @ 8.50¢; Tire Steel, 2.25¢; Open-Hearth Machinery Steel, 2.40¢; Open-Hearth Spring Steel, 2.50¢; Crucible Spring Steel, 3.75¢; Sheet Steel, 7¢, 8¢ and 10¢, according to grade.

**Steel Rails.**—Very little new business was booked during the past week. The South Chicago Works will shut down this week for slight repairs, to be started up again as quickly as that work is completed. Prices are unchanged from the old rate of \$30 @ \$30.50.

**Old Rails and Wheels.**—A number of transactions in Old Iron Rails are reported at \$20.25 @ \$20.50, Chicago, but the bulk of sales was for delivery at other points than this city. Prices are weaker, and \$20 is now a fair quotation. The demand for Old Steel Rails keeps pace with the supply, and lengths suitable for slitting maintain a value of about \$19. Old Car-Wheels are becoming plentiful, and considerable quantities are now offered for sale, but are not being pressed, holders asking \$18.50 @ \$19 for them.

**Scrap.**—The stock of Mill Iron here was pretty well cleaned up by a large consumer last week. Cast Iron was also in better demand than had been the case for several weeks. Forge Iron is utterly lifeless, and some dealers assert that if it was offered at \$18 consumers would not take it. Dealers are still paying \$18 for Mixed Country Scrap. Carefully Selected is quoted to consumers as follows, per ton of 2000 lb: No. 1 Forge or Railroad Shop, \$18.50 @ \$19; Track, \$18.50 @ \$19; Fish Plates, \$20 @ \$21; Axles, \$24; Horseshoes, \$18.50; No. 1 Mill, \$13.50 @ \$14; Pipes and Tubes, \$13 @ \$14; Light Iron, \$9; Cast Machinery, \$13; Stove Plate, \$10; Cast Borings, \$8.50; Wrought Turnings, \$11.50; Axle Turnings, \$13 @ \$14; Mixed Steel, \$11.50; Coil and Leaf Steel, \$14; Tires, \$15.

**Nails.**—Something of a sensation has been caused by the wide distribution of a circular put forth by the Jefferson Iron Works, of Steubenville, Ohio, quoting the following prices for factory lots of Steel Nails:

Assortment running 20¢ above base, \$1.85 rates at factory.  
Ditto, 21¢ @ 80¢, \$1.80 rates at factory.  
Ditto, 31¢ @ 40¢, \$1.75 rates at factory.  
Ditto, 41¢ @ 50¢, \$1.70 rates at factory.  
Ditto, 51¢ @ 60¢, \$1.65 rates at factory.  
Ditto, 61¢ @ 70¢, \$1.60 rates at factory.  
Ditto, 71¢ @ 80¢, \$1.55 rates at factory.  
Ditto, 81¢ and upward, \$1.50 rates at factory.

This is a heavy cut in extras, and will call for decisive action on the part of the other manufacturers. The next meeting of the Western Nail Association will probably be very interesting to the participants. Jobbers are still selling Steel Nails at \$2 for small lots and \$1.95 for carloads; Wire Nails, \$2.40 for small lots and \$2.35 for carloads, but these prices are occasionally shaded.

**General Hardware.**—Last week was the heaviest of the year thus far in Shelf Hardware, with trade apparently on the increase. The month of March was remarkably good with all the houses here, so far as the volume of business would make it good, but jobbers have been obliged to sell on very close margins. In Steel Goods particularly competition has been very active, and it is stated that jobbers along the Mississippi have reduced their quota-

tions to manufacturers' discounts, having evidently stocked up too heavily. An extraordinary demand is noted for Bicycles, especially safety machines, some houses being from two to three weeks behind their orders in consequence of the inability of manufacturers to deliver them fast enough. In staple goods there is an increasing disposition by manufacturers to curtail production with a view to getting better prices. Heavy Hardware is in better demand than it was at the same time last year, but prices are lower of course and margins are smaller, except for Wood stock, which holds up very firmly on account of the diminishing supply of hardwood.

**Barb Wire.**—The improved tone which was noted last week is maintained. Jobbers quote Painted at 2.80¢ for small lots, with 60¢ @ 65¢ per 100 lb advance for Galvanized.

**Pig Lead.**—Dealers report light business but a large inquiry, with quotations at 3.45¢ for carloads. At the close 3.40¢ is bid for spot and April delivery, with 3.45¢ asked, and 3.45¢ bid for May, with 3.50¢ asked.

W. S. Mallory & Co., dealers in Plate Iron and Steel, have removed from No. 22 West Randolph street to No. 7. Their new office will give them much better facilities for handling their increasing trade and is also in close proximity to their warehouse.

John McLaughlan, manager of the Chicago office of the Andrews Brothers Company, has issued a circular calling attention to the special qualities of the Haselton Scotch Pig Iron made by that company at their furnaces near Youngstown, Ohio. A unique feature of the circular is the word "Haselton," printed on the margin, with each letter apparently composed of pieces of Pig Iron artistically disposed and engraved. The company's works now have a capacity of 150 tons of Finished Iron a day. This summer their furnaces will be completely remodeled and brought up to the latest practice.

## St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,  
St. Louis, April 1, 1889.

**Pig Iron.**—There is hardly any business doing at the present writing. Occasionally sales are made amounting to between 100 and 200 tons, but large buyers seem to be out of the market, for the present at least. The various industries that are naturally associated with the Iron trade, such as machine shops, stove foundries, pipe mills, &c., are all pretty well filled up with orders, but they are either holding off with the expectation of lower figures in the near future or are supplying their needs from hand-to-mouth with the same end in view, and do not appear anxious as to the ultimate outcome. Several lots of No. 2 Southern Coke Foundry were taken during the past week at about \$15, delivered. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	\$15.50 @ \$16.00
Southern Coke, No. 2 Foundry,	15.00 @ 15.25
Southern Coke, No. 3 Foundry,	14.50 @ 14.75
Gray Forge.....	13.50 @ 14.00
Ohio Softeners.....	18.00 @ 20.00
Lake Superior Charcoal.....	21.00 @ 21.50

### Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

### Tennessee.

Charcoal Foundry, No. 1.....	17.50 @ 18.50
Charcoal Foundry, No. 2.....	16.75 @ 17.50

Connellsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.

**Bar Iron.**—The remarks made last week in reference to this department hold good to-day. The volume of business continues

large, but prices are very unsatisfactory and there is nothing in the immediate future that justifies any improvement. Lots from store are quoted at \$1.80; carload lots from \$1.65 to \$1.75, according to circumstances.

**Barb Wire.**—There is a steady increase in the volume of business during the past week, and manufacturers are kept busy keeping up with the demand. The market has steadied to some extent, and although prices are commonly reported as being demoralized, yet the bids made by buyers are nearer to the sellers' figures than they have been for some time. Mills quote as follows for carload lots: Two and Four Point Painted, \$2.80; Two and Four Point Galvanized, \$3.40, f.o.b. St. Louis. Less than carload lots, 5¢ additional.

A. P. De Camp & Co., Laclede Building, St. Louis, Mo., have been appointed sole agents in the West for Rising Fawn and Chattanooga Southern Coke brands.

Rogers, Meacham & Shields, Laclede Building, St. Louis, Mo., have the agency in this territory for the sale of the Irving brand of Foundry Iron manufactured by Mayville Furnace, Mayville, Wis.

## Louisville.

LOUISVILLE, KY., April 1, 1889.

**Pig Iron.**—The market has been more active this week than for some time past. Inquiries have been numerous and several good sales have been made. Prices are firmer and show a slight increase. Furnaces do not seem inclined to take orders for very long deliveries at present prices, and there seems to be a much better feeling among them. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
" " No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 23.75

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. (CINCINNATI, April 1, 1889.)

**Pig Iron.**—The local market for Pig Iron has changed but little during the past week. The volume of business has been light, but prices have not changed essentially. Buyers, who a few weeks ago were anxious to complete contracts for several months in the future, are now holding off in anticipation of lower prices or some advantage in time of delivery. At the same time, sellers are not pressing iron, and are not making figures below the present level, at least not openly, although sellers of Ohio Iron draw information from the trade that the Southern product is being sold at lower prices. Car-Wheel Iron, more especially the Southern output, is quiet and the higher numbers are accumulating. Lake Superior Car-Wheel is meeting with more favor, and some sales to Springfield are reported at very low prices on four months' time. One sale of Gray Forge of about 750 tons is reported at \$13.25, cash. Foundry grades are in moderate supply and relatively stronger than Forge Iron. Regarding the output it is claimed that the new furnaces to blow in and the old ones to resume operations will provide about an equal amount of iron as the stacks blowing out have made, so that there is no immediate prospect of any essential change in the amount of iron

to be disposed of in this section. The following are the approximate prices current here at the close, for cash, f.o.b.:

### Foundry.

Southern Coke, No. 1 (new classification).....	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification).....	14.50 @ 14.75
Southern Coke, No. 3 (new classification).....	13.75 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

### Forge.

Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	12.25 @ 12.75
Gray Forge.....	13.00 @ 13.50

### Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

**Manufactured Iron.**—The demand for all kinds of Manufactured Iron has been light and an easy tone has prevailed.

**Nails.**—The market has remained steady with a fair demand in a jobbing way; 12d @ 40d sell at \$1.95 @ \$2 ½ keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.80 ½ keg.

**Old Material.**—There have been moderate offerings of Old Rails at \$20.50 @ \$21, cash, but little demand. Old Wheels have been offered at \$18 @ \$18.50 ½ ton, but dull.

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave. (PITTSBURGH, April 2, 1889.)

It was expected that March would show an improvement on February in general business, but this expectation was not realized; there is not much doubt, however, that April will show an improvement on March, although it may not come up to the expectations of the more sanguine. There is always an increased demand in April, not only for Iron and Steel, but for all kinds of manufactured goods. Architects report that they have all and more than they can do; that there will be more improvements made in this city than for a number of years past, despite an oppressive taxation, and reports from various points West and South are of a similar character. One of the effects of the oppressive taxation noted is to cause a great many manufacturers to move their works outside of the city limits and new firms to locate outside.

The river Coal trade continues in an exceedingly depressed condition, the markets below being overstocked, and it looks now as if nearly all the river Coal works, employing some 6000 miners, would be idle within the next week or two. Some of the Westinghouse plants, it is said, will shortly work their men only eight hours a day and four days a week. The Chicago Steel Rail manufacturers are reported as having closed contracts within the past few days for 700,000 tons of Bessemer Ore, at \$5.50 ½ ton, delivered at Lake ports. While Chicago has the advantage of Pittsburgh in cheaper transportation in Ores, being so much nearer the Lake Superior Ore fields, Pittsburgh still has the advantage of cheaper fuel, which more than overcomes the former. It is claimed that Chicago will never be a very formidable competitor of Pittsburgh in the way of manufactured goods.

**Pig Iron.**—There has been no perceptible change in the situation during the past week; trade continues very dull; there is not the business there was a few weeks ago, and the market is weaker. While most, if not all, of the city furnaces

are well sold up and are indifferent about making additional contracts, there is said to be considerable offering here from the Mahoning and Shenango valleys, notwithstanding it was claimed a few weeks ago that furnacemen out there could do better at home than in this market. Production is being reduced, as we hear every now and again of furnaces blowing out, some for repairs and others to wait for a better market. So far as relates to furnacemen, not for several years has the market been in a more unsatisfactory condition than at present. We quote prices as follows.

Neutral Gray Forge.....	\$14.25 @ \$14.50, cash
All-Ore Mill.....	15.50 @ 16.00, "
White and Mottled.....	13.50 @ 14.00, "
No. 1 Foundry.....	16.25 @ 16.50, "
No. 2 Foundry.....	15.50 @ 16.00, "
No. 1 Charcoal Foundry.....	23.50 @ 24.00, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
Cold Blast Charcoal.....	25.00 @ 25.00, "
Bessemer Iron.....	16.50 @ 16.75, "

Both Forge and Mill Irons have gone off 25¢ ½ ton within the past two weeks.

**Muck Bar.**—Continues dull, but there has been no notable change in prices; for immediate delivery, \$26.50 @ \$27. Sale of 1000 tons for May at \$27, cash.

**Ferromanganese.**—Sales of several lots reported at \$59.50 for 80 %; Spiegel is still quoted at \$29 @ \$30 for 20 %.

**Manufactured Iron.**—Regular Merchant Iron does not improve much; demand continues very light for this season of the year, and prices unsettled and unsatisfactory. First quality Iron is quoted at 1.65¢ @ 1.70¢ rates for Bars, 60 days, 2 % off for cash; Old Rail Iron is said to be offering at 1.50¢ rates, but a great many buyers, especially those having a regard for quality, prefer to pay the difference for the former. Skelp Iron is still quoted at 1.65¢ for Grooved, and 1.90¢ @ 1.95¢ for Sheared. There is not the demand usual at this particular time for several years past, but it will doubtless improve as the season becomes more advanced.

**Nails.**—The Nail trade continues as dull as ever, and there does not appear to be much prospect of any immediate improvement. There appears to be no demand, and manufacturers here, notwithstanding this is usually the busy season, are doing next to nothing, and reports from Wheeling are of a similar character. A few large contracts were made early in the present year, but since then there has been scarcely anything done. Demand chiefly of a local character for small lots. Card rates are being maintained, and we continue to quote 12d to 40d \$1.90, 60 days, 2 % off for cash.

**Old Rails.**—There have been no sales since last report, in absence of which we continue to quote American Tees at \$23 @ \$23.50, cash. Brokers report but very few offerings, and with any demand the market, it is generally believed, would soon stiffen. We can report a sale of 500 tons Old Steel Rails at \$19, cash, for long lengths.

**Wrought Iron Pipe.**—There is a fair business. This is about the time the Pipe trade commences to open up, and it is expected that orders will be offering more freely within the next week or two. So far as we can learn, the rates agreed upon at the meeting in New York two weeks ago are being faithfully adhered to; the meeting showed good sense in putting prices at a point where they could not be cut and afford a margin for profit; however, the great point was to have them uniform and thereby avoid a good deal of confusion and bad blood. Discounts on Black Butt Pipe 55 %; Galvanized do., 47½ %; Black Lap-Welded, 67½ %; Galvanized do., 55 %; Boiler Pipes, 62½ %; Casing, all sizes, 62½ %; Two-inch Tubing, 13¢ ½ foot, net.

**Steel Rails.**—Heavy sections are still being quoted at \$28 for small lots, but

large orders are being placed for considerably less. The new mill of the Allegheny Bessemer Steel Company, recently started up, is reported as doing good work.

**Billets, Blooms, &c.**—Bessemer Steel Blooms and Billets are quoted at \$27 @ \$27.50, cash, according to size, quality and delivery. Nail Slabs are quoted at \$27, with very little demand. Domestic Bloom and Crop Ends, \$18, at which last sale was reported. There has been considerable inquiry of late for Bloom Ends.

**Railway Track Supplies.**—No change in prices. Spikes, 2¢, 30 days, free on cars, Pittsburgh. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square, and 2.85¢ with Hexagon Nuts.

**Old Material.**—Demand continues light, prices weak. No. 1 Wrought Scrap, \$19 @ \$19.50, ½ net ton; Wrought Turnings, \$18 @ \$18.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross ton; Old Car-Wheels, \$19; Cast Borings, \$11 @ \$12, gross ton.

S. P. S. Ellis, for a number of years with the Cambria Iron Company, Johnstown, Pa., has returned to Pittsburgh, and is now located in the Penn Building, in that city. Mr. Ellis is the Pittsburgh representative of the Johnson Company, and also of A. J. Haws & Son, manufacturers of Haws' Fire Brick and Silica Brick, of Johnstown, Pa. In addition to this, he will carry on a general brokerage business in Iron and Steel of all descriptions.

The Pittsburgh office of the National Tube Works Company, which is located in the Monongahela House, will shortly be removed to the top story of the Lewis Block, at the corner of Sixth avenue and Smithfield street, in that city, and will occupy the entire floor.

## Cleveland.

CLEVELAND, April 1, 1889.

**Iron Ore.**—All of the new features of the market are in accord with the trend of events as outlined in these quotations during the past six or eight weeks. The Ore men are again forcing the vesselmen into line, and are obtaining charters from Escanaba to Ohio ports at \$1, and from Two Harbors and Ashland at \$1.25; high-grade Bessemer Ores are in demand at \$5.75 ½ ton, f.o.b. vessels at Lake Erie ports. Gogebic Bessemer will be placed upon the market at \$5.25, with high-grade non-Bessemer Ores, from all ranges, quoted at \$4.15 @ \$4.25. These prices do not vary materially from those of last year, with, however, the cost of transportation considerably reduced. The total amount of Ore that has been sold for Chicago delivery probably aggregates 900,000 tons. Considerable non-Bessemer Hematite Ore is reported to have been sold for far-Eastern furnaces at \$4.25, f.o.b. vessels, Buffalo. The purchases of Vermillion Ore for the same furnaces probably exceed 300,000 tons at prices not far from \$5.75 at Buffalo. While the furnacemen who receive their Ores via Cleveland, Fairport and Ashtabula have not as yet made heavy purchases, they are interested in negotiations for round lots of Republic and Champion Ores at about \$5.75, and Menominee Range Ores at \$5.10 @ \$5.20.

**Pig Iron.**—Bessemer Iron is in good demand, but the market generally does not retain the feeling of firmness that has characterized it for several weeks. Foundry Irons are almost out of the market, and although Mill Iron is in better favor the inquiry for it is limited. There is no apprehension of lower prices, but the fear is expressed that the revival hoped for by April 1 may be delayed until May. The

general condition of the market is represented in the following quotations:

No. 1 to 6 Lake Superior Charcoal.....	\$20.50 @ \$21.50
No. 1 Strong Foundry, Bessemer quality, ½ ton.....	17.00 @ 17.50
No. 1 Strong Foundry, ½ ton.....	16.00 @ 17.00
No. 2 Strong Foundry, ½ ton.....	15.00 @ 16.00
No. 1 American Scotch, ½ ton.....	17.00 @ 18.00
No. 2 American Scotch, ½ ton.....	16.00 @ 17.00
No. 1 Soft Silvery, ½ ton.....	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, ½ ton.....	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, ½ ton.....	14.50 @ 15.50

**Manufactured Iron.**—The market is firm, with prices somewhat improved. Common Bar Iron at 1.60¢ is in good demand, and Sheets are strong at \$2.75 for No. 24 as a basis for quotations.

**Old Rails.**—An active buying movement has characterized the market during the past week, Old American Rails bringing \$22.50 readily. There is some demand for Wheels at \$19 @ \$19.25.

(Later, by Telegraph.)

Eastern furnacemen are buying liberally of non-Bessemer Ores, at about \$4.15, f.o.b. vessels Buffalo. Menominee range Bessemer are reported to have sold to-day at \$5.10 @ \$5.20, f.o.b. vessels at Lake Erie ports. Additional sales of high grade Bessemer at \$5.75 have occurred this week. Just now there is a large demand for non-Bessemer at prices ranging from \$4.10 to \$4.25. A dozen charters, based upon \$1 rate from Escanaba, are reported to-day.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, April 1, 1889.

**Pig Iron.**—The present status of the market is practically unchanged, and everything appears to be working smoothly and in about the same groove that it has been for the past few weeks. So far, as to the feeling expressed by the Southern producers, there does not appear to be much concern manifested as to the future, as it appears to be an opinion that the future, so far as they are concerned, will take care of itself. Sales are being made right along at prices that they deem somewhat remunerative, and any addition to the prices they get is so much gain. As a fair condition of the market, we note the sale of 1250 tons No. 2 Foundry to New York at \$17, delivered, which nets the furnace \$13.25 cash, or say \$13, after taking off commissions. While all the Iron sold in that market will not come up to that figure, the only concessions that are being made are in consequence of inferior grades and Irons that are not so well known. At the prices that are now ruling nearly all the furnaces are keeping their yards well cleaned up, and as a general thing are not extending as long credits to their customers as they did a few months ago; their expenses are also being cut down to a considerable extent, all of which goes to lessen their expense account to a very great extent. With the exception of the stacks that are out for repairs, all are at work to their utmost capacity; and as an index of the feeling as to the future there are no cessations in the construction and pushing ahead of the new plants that have been inaugurated nor of those that are being built

## Detroit.

WILLIAM F. JARVIS & Co., under date of April 1, 1889, report as follows: The market has been more active during the week under review than for some time past, and a number of orders for round lots have been booked. The Lake Superior Charcoal trade has been especially lively, and several large concerns have purchased who do not usually place orders until later in the season. There seems to be a growing impression among consumers

that those who place orders early will obtain the most favorable terms and lowest prices, and sellers anticipate a large amount of buying in April. While the demand for Coke Irons has not been so large as for Lake Superior Charcoal, yet it has shown more strength than recently. We are able to report a satisfactory trade, with prices ruling about as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.75 @ 19.25
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.75 @ 19.25
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

## New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, April 3, 1889.

**American Pig.**—The market is very quiet, with only a moderate hand-to-mouth business progressing. Some Southern Iron is again pressed for sale, and reports of low figures are current. We have been unable, however, to learn of any transactions at the figures named. We quote for standard Northern brands, tidewater delivery, \$17.50 @ \$18 for No. 1 Foundry; \$16.25 @ \$17 for No. 2 Foundry, and \$15 @ \$15.50 for Gray Forge. Southern Foundry Irons are from 50¢ to \$1 lower.

**Ferromanganese.**—There is some business at \$57 @ \$57.50 for Foreign 80 %.

**Structural Iron.**—It is stated that the Brooklyn Elevated work taken two weeks since aggregates about 10,000 tons, and was taken by an Eastern Pennsylvania beam mill and a bridge works, operating together. The James River Bridge, calling for about 1000 tons of Iron, was secured by an Eastern Pennsylvania works. A lot of 1500 tons of Beams for a store building on Broadway was taken by a local architectural concern, the low bid being accepted with the understanding that Steel Beams could be used. There are coming up in the near future three large new office buildings in this city. We quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

**Bar Iron.**—We quote: Carload lots on dock, half extras, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Steel Rails.**—The market is moderately active and steady. We are reported sales of 3000 tons to an Eastern road, 8000 tons to the Southwest, 3000 tons to Arizona, and a round block taken by the Chicago mills, for St. Paul delivery, for a new Northwestern enterprise. Three of the Eastern mills competed for this order, being able to make Duluth delivery, which they had the option to do, at a shade over \$30. The Board of Control has increased the allotment by 200,000 tons, the basis of percentage being the same as that for the first allotment. So far as we can learn the first allotment, which some of the mills did not avail themselves of, has not yet been distributed among the other mills, which it was understood was the agreement. We quote \$27 @ \$27.50, at Eastern mill, for large blocks.

**Scrap Iron.**—The inquiry for Scrap continues very light and little business is being done. Prices remain firm at about last week's quotations, which we repeat: No. 1 Scrap, \$20.50 @ \$21, for carload lots, delivered; Turnings, \$18 @ \$14, for cargo lots, do.; Cast Scrap, \$15.50 @ \$16, do., and Horseshoes, \$23 @ \$23.50.



**Billets.**—It is rumored that a sale of considerable magnitude of Wire Billets has been closed by an Eastern Rail mill.

**Wire Rods.**—The market is dull for Foreign Wire Rods, with prices nominally \$41.25 @ \$41.50. Reports from abroad are to the effect that a further rise in Steel Billets is imminent, and that, therefore, Wire Rods must then develop a rising tendency.

**Merchant Steel.**—The market continues very unsettled, with low prices cropping up from time to time. Tire Steel has been sold in Boston lately in moderate quantities at 2.15¢.

**Old Rails.** Aside from a few small lots no transactions are reported. The supply here is still very restricted. It is stated, however, that two lots of 2500 tons each from local roads are available to Eastern Pennsylvania mills, and that bids have been asked on a lot of about 4000 tons in the South. We continue to quote, nominally, \$28.

**Track Fastenings.**—We quote, delivered, Spikes \$2, and Angles \$1.75 @ \$1.80.

F. G. Gorham, recently appointed Eastern sales agent of the Allegheny Bessemer Steel Company, the new Steel Rail mill near Pittsburgh, has established temporary headquarters at 3 Cliff street. He will remove to the Mills Building on May 1.

## Financial.

Trade conditions are generally regarded as more favorable than a week ago, for several reasons. There is no longer any apprehension concerning the April settlements or the course of the money market in the immediate future. Contrary to expectations gold shipments have not been renewed. Foreign purchases of American securities, together with increased exports of corn, cotton and other domestic products, affect favorably the course of exchange, while imports have at least temporarily fallen off. Railroad earnings are larger, because of the early opening of navigation. The lake and rail lines have begun quoting through rates for the summer season of 1889, which are about 5 ¢ @ 100 lb lower than existing through rates by rail. Respecting the condition of affairs in the West the *Inter-Ocean* says: "The country tributary to Chicago is in apparently more prosperous condition than a year ago, and the agricultural season is probably about three weeks in advance of the average spring. These things stimulate the borrowing of merchants, manufacturers and agriculturists everywhere, and there are more of them who depend upon Chicago capital each year." In Boston apprehensions are expressed on account of the extended loans of the banks, and the liability to further expansion, while assets of all descriptions have shrunk a good deal. More failures, it is intimated, are not impossible. The settlement of the weavers' strike in Fall River has removed what might have become a disturbing element. The prices of several leading staples have a downward tendency. Wheat is 3½ cents lower. The flour market on spring stock is gone to pieces on the breaking up of the combination of millers in spring wheat sections. Spot cotton is firm and in good demand. Among grocery jobbers there is a cheerful tone, and the business of the month compares well with last year. Coffee broke on news of a heavy decline in Havre, attributed to fears of the financial situation in Europe. In sugar there is a decided gain. Japan teas are advanced. Dry goods jobbers are less active.

The Stock Exchange markets were irregular, and all the leading granger and

Southwestern stocks showed a decline of 4 @ 10 % during the month, mainly due to the pressure to sell rather than to manipulation. Atchison dropped to 89½, as compared with 50 about a fortnight ago, and still enters largely into current transactions. There was also a steady outpour of Reading. An attack on Lackawanna immediately followed the declaration of its usual dividend, on the assumption that this payment is not warranted by the condition of the coal trade. Rumors of a receivership for Atchison were contradicted. Troubles in the West, however, have a depressing influence on the general markets, the trunk line stocks and coal stocks not excepted. On Monday Atchison absorbed attention, the belief becoming more general that Gould has designs on the property, and prices were lower. On Tuesday the market opened steady to strong. In the afternoon the speculation was less active, but the undertone was firm, and in the last hour the market was very strong, the closing prices being the best of the day.

United States bonds were quoted as follows:

U. S. 4½, 1891, registered.....	108
U. S. 4½, 1891, coupon.....	108
U. S. 4, 1907, registered.....	123½
U. S. 4, 1907, coupon.....	123½
U. S. currency 6s.....	120

The New York Associated Banks report a loss in reserve for the week of \$1,248,800, reducing the surplus to \$5,450,125, against \$9,145,575 in 1888 and \$4,379,825 in 1887. The most important change in the items was a decrease in deposits of \$3,566,000. There was a loss in specie of \$1,697,000 and in legal tenders of \$443,300. Loans were contracted \$288,200. The banks, it was estimated, lost over \$3,000,000 through the operations of the Sub-Treasury and the movement of currency to the interior, chiefly to the West. It is remarked, however, that the Western money markets are more quiet than usual at this season. In the absence of gold shipments money in New York has been comparatively easy. Time loans are 4 % for 30, 60 and 90 days, but loans for four, five and six months can be made on first-class collateral at 4½ %. It is expected that after the middle of April the banks will discount more freely. Rates are 4½ @ 5 % for 60 @ 90 days. Altogether the financial situation is better than was expected. The Secretary of the Treasury has not announced a change of policy in regard to the buying of bonds and continues to accept only 4½ % at the current price. April payments in New York and Boston on account of interest and dividends amount to about \$55,000,000. Assistant Secretaries Batchelor and Tichenor assumed office on Monday.

The market for sterling is firm at \$4 89½, actual business. The supply of cotton bills is small. The influence of the export movement may become more noticeable now that the prices of wheat are down near the point where foreigners can buy. The better feeling in England appears from the fact that the bank rate of discount remains at 3 %, although misgivings are felt respecting institutions in France. Silver is lower.

The President nominates James N. Huston, of Indiana, to be Treasurer of the United States, and Ellis H. Roberts, of New York, to be Assistant Treasurer at New York City. Interstate Commerce Commissioner Walker has filed his opinion in the investigation recently held by the commission to determine how far Southern railroads are complying with the fourth section, or long and short haul clause, of the Interstate act. It appears that upon many of the lines tariffs of some of the companies have been brought quite generally into harmony with the rule of the law; some exceptions, however, remain. The order of the commission is that the car-

riers named in the order of notice comply with the statute in the particulars and respects pointed out without unnecessary delay, and make report to the commission of their action in the premises. If action so reported shall seem to fall short of what is required by the law, further action will be taken.

The surplus in the Treasury April 1 is \$54,006,896—an increase of nearly \$6,000,000 since March 1. On April 1, 1888, it was \$104,000,000, or nearly twice what it is at present. The revenues for the month have been unusually large. The public debt statement shows the principal of the interest bearing debt to be \$915,085,532, of which \$155,147,800 is in 4½ % bonds and \$681,139,000 in 4 % bonds. The decrease of debt during the month was \$13,605,655. The decrease since June 30, 1888, has been \$50,900,994. The excess of revenues thus far is about \$46,500,000: during the same period of the last fiscal year it was over \$83,000,000.

The Coffee Exchange decided to purchase for \$230,000 lots on Beaver steet on which to build.

The exports of specie from this port during the week amounted to \$1,015,000, making a total since January 1 of \$11,463,000, against \$7,175,000 for the same time last year. The imports were \$72,000.

The imports of merchandise at this port during the week were valued at \$8,121,000, of which nearly \$2,500,000 represents dry goods. Since January 1 the total is \$130,919,000, as compared with \$124,445,000 for the same time last year.

## Metal Market.

**Copper.**—Matters in the Copper trade here have been kept in abeyance by the negotiations supposed to be going on in Paris between the representatives of our mining companies and the parties who hold the bulk of Copper left by the syndicate. Moderate quantities of Lake can be bought at 16¢; for spot and April 15¢ is offered. Casting brands have sold in small lots at 14¢, although the leading refiners are understood to have an arrangement to sustain the market. In London there has been more doing than heretofore; when we reported last, the price all round was £40, and, after declining to £39. 5/, it advanced to £40. 10/, spot, yesterday, and futures to £40. 5/. Over 1000 tons of Copper were sold in London Monday and Tuesday, taken together. The January export of Pyrites from Spain was 84,059 tons, against 60,395 in 1888 and 55,831 in 1887; of Precipitate, 3032, against 2022 and 3313.

**Tin.**—Since our last report spot Tin has advanced from £93. 12/6 to £94. 15/ yesterday, and futures rose from £94. 10/ to £95. 12/6. The statistics on the 1st inst. were satisfactory, the visible supply in Europe and America being 14,519 tons, as compared with 14,930 on the first day of March. The spot price of Tin in New York is 21½¢ this morning, after sales of 95 tons Spot at 20.95¢ and 21.10¢, 50 tons June and July at 20.90¢, and 10 July at 21¢. **Tin Plates.**—The demand is moderate, but prices are being forced up here by the firmness abroad. Futures are higher by 10¢ @ box over spots. The range for Coke Tins at Liverpool is 13/8 @ 13/6, and the spot quotations in this city have to be raised to the following figures: per box, large lines: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.75; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.30 @ \$4.40, and Wasters \$4.15 @ \$4.20.

**Lead.**—Since our last report some 700 tons Common Domestic were taken by consumers at 3.67½¢, which is the closing quotation on a dull market. At St. Louis the quotation is 3.40¢ @ 3.42½¢. The January Pig Lead export from Spain

was 10,117 tons, against 12,907 tons in 1888 and 11,798 in 1887; 65,000 lb April Lead brought 8.67½¢ on 'Change.

**Spelter.**—The spring demand does not yet show itself, causing the inquiry to continue slack, while the supply is ample. The range for Common Domestic is between 4.65¢ and 4.70¢, and Silesian is nominally quotable 5.50¢ @ 5.62½¢. Spain exported in January 881 tons of Calamine, against 680 last year and 2290 in 1887. As per Henry R. Merton & Co.'s London statement, the world's Spelter production in gross tons has been as follows:

	1888. Tons.	1888. Tons.
Rhenish Prussia and Belgium...	133,245	129,020
Silesia.....	83,375	81,630
England.....	26,638	20,730
France and Spain.....	16,140	15,306
Poland.....	3,785	4,145
Austria.....	3,827	3,780
United States.....	297,005	254,590
	50,000	38,072
Total.....	317,005	292,692
Average price in London.....	£18. 1/8	£14. 5/

**Antimony.**—Has been in moderate, but steady demand at 12¢ @ 12½¢ Hallett's and 13½¢ @ 13½¢ Cookson's.

#### New York Metal Exchange.

The following sales are reported:

<b>THURSDAY, March 28.</b>	
25,000 lb G. M. Copper, July.....	10.05¢
25 tons Tin, June.....	20.90¢
25 tons Tin, July.....	20.90¢
<b>FRIDAY, March 29.</b>	
40 tons Tin, spot.....	20.95¢
16 tons Tin, July.....	21.00¢
16 tons Lead, spot.....	8.67½¢
<b>SATURDAY, March 30.</b>	
10 tons Tin, spot.....	21.00¢
25 tons Tin, spot.....	21.10¢
<b>MONDAY, April 1.</b>	
10 tons Tin, spot.....	21.05¢
<b>TUESDAY, April 2.</b>	
50 tons Lead, June.....	8.72½¢
<b>WEDNESDAY, April 3.</b>	
32 tons Lead, April.....	8.67½¢
10 tons Tin, May.....	21.25¢
10 tons Tin, May.....	21.30¢

The annual election of officers of the Metal Exchange was held on Monday. There were 91 ballots cast, and William H. Davol was elected president by 46, against 40 cast for the previous incumbent, Mr. Talmadge Delafield. The full list of new officers follows:

President, Wm. H. Davol; vice-president, R. M. Thompson; treasurer, Carl Mayer; secretary, Edward J. Shriver. Managers: Eben B. Clarke, B. Hochschild, Geo. E. Moore, E. A. Caswell, Geo. Nissen, J. M. Clark, Talmadge Delafield, W. I. Russell, Spencer Jennings, Edmund Hendricks, A. Bennett, Jos. Byrne, C. P. Cort, M. B. Smith. Arbitration Committee: J. J. Williams, Lucius Hart, Chas. S. Trench, F. Steiner, T. I. Crane. Inspectors of Election: Geo. N. Frecker, J. F. Haas, Wm. Hagan.

#### Coal Market.

No improvement has taken place in the Anthracite trade, which remains very dull, with stocks accumulating at tidewater and interior points. A feeling was entertained that a decision of the questions relating to tolls, which it was hoped would be reached at the adjourned meeting, appointed for this week, would impart more life to the market. Some differences of opinion in reference both to prices and output have been expressed, the Reading seeming to be particularly restive under restraint and anxious to avail themselves of the advantages recently acquired in opening new collieries. It is understood that this company were not represented at the recent meeting of coal managers in this city, and in fact are opposed to a reduction of tolls, on the ground that individual operators, who are cutting the market, would only be aided in making further concessions. Touching this point, the Philadelphia *Ledger* remarks: "The Lehigh

Valley Railroad are reported to be in favor of an immediate reduction of 10 cents per ton, while the Pennsylvania Railroad are said to be on the fence, willing to go with the majority if in their opinion the trade can be benefited by a reduction." The output of Anthracite for the week ending March 30 was 481,472 tons, as against 780,402 for the corresponding week last year, the reduction being nearly 800,000 tons. The total production thus far for the year is 6,887,784, which shows a decrease of nearly 900,000 tons as compared with the same period a year ago.

The Bituminous trade is quiet. It has been reported that a number of New England manufacturers have already contracted for this year's supply, taking about 30,000 tons each. The New York, New Haven and Hartford Railroad Company are in the market for 200,000 tons of Coal, to be delivered at New Haven, Harlem River, Forty-sixth street, Stamford, Saybrook Point and Bridgeport. Proposals are to be in by April 15.

It is said that there are still a number of interests who have not joined the Seaboard Steam Coal Association, including the following Clearfield shippers: Victoria Coal Company, Robert Hare Powel & Co., the Clearfield Consolidated Coal Company and Messrs. Mitchell & Lazar.

It is announced that parties whose interests are identical with those of the Pennsylvania Railroad have purchased 3000 acres of Coal land in the Madison field, near Greensburg, Pa. The plans include the construction of a new branch road to give the property a connection.

#### Imports.

##### Hardware, Machinery, &c.

Bloomfield, J. C. & Co., Mach'y Castings, &c., cs., 10  
Boker, Carl, F., Mdse., cs., 10  
Boker, Hermann & Co., Iron Chains, casks, 18; Mdse., cs., 27  
Clark, G. A. & Bro., Mach'y, cs., 470.  
Degrauw, Aymar & Co., Cables 25  
Eric Despatch Co., Mach'y, cs., 2  
Hartley & Graham, Guns, cs., 9  
Hammel & Co., Hdw., cs., 8  
Hanson, Chas. A., Mach'y, cs., 14  
King, Hezekiah, Mdse., cs., 3  
Newcastle Nail Co., Mdse., cs., 2  
Noyes, Smith & Co., Hdw., cs., 5  
Oastler, W. C., Mach'y, pkgs., 11  
Sellers, W. B., Mdse., cs., 6  
Sumner & Co., Chas. F., Mach'y, cs., 2  
Trades Dispatch, Mach'y, pcs. and pkgs., 38  
Von Cleff & Co., Iron Chains, casks, 12  
Ward, Jas. E., Mach'y, pkgs., 46  
Wiebusch & Hilger, Lim., Mdse., cs., 56; Hdw., pkgs., 15  
Witte, John G. & Bro., Cutlery, cs., 4  
Order, Mach'y, cs., 8; Files, casks, 15.

#### British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 3, 1889.

A prominent feature of the Copper market has been a decline in the price of Bars to £39. 5/, at which 1500 tons changed hands for prompt delivery, besides several lots for forward. Consumers purchased largely. Since these sales were made there has been a steady demand, under which prices advanced to £40. 10/. Some stocks held by French banks were realized upon, the institutions having been instructed to negotiate.

The formation of the proposed new pool is advancing. A scheme has been agreed upon, but the working details are yet to be settled. The syndicate has been formed to remodel the Comptoir on a fresh basis. The liquidators have had an interview at Paris with the American mines' delegates. The results are not made public, but said to be the best anticipated and satisfactory. The former agents of the syndicate have been quiet since the collapse.

The Chili charters for April, per telegraph, amount to 1600 tons.

Block Tin has been virtually neglected up to within a few days. Cash Straits declined to £93. 10/, and forwards dropped proportionately. There has since been a recovery to £94. 15/, which is attributed to the result of the Dutch Banka sales on Friday, when 24,300 slabs realized an average of £95 in Holland.

The demand for Tin Plate has continued brisk, and the higher prices established last week are maintained. At a meeting of the makers held at Swansea it was decided, by a large majority, not to establish a syndicate. The new Givalia works, at Kidwelly, are now in the course of erection.

Outside speculation in Pig-Iron warrants has been small, but the market continues strong, being stimulated by large demand for consumption and export. The tendency of prices is still upward. Good orders are received from Canada and the Continent, but American orders are scarce. Two additional furnaces are starting up on Hematites, the present demand being in excess of the output. Makers' brands of Scotch have advanced 6d @ 1/ during the week; Middlesboro' Pig has been sold at a 2/ advance and Hematites are a full 6d higher.

The market for Manufactured Iron has been very active, and prices are strong, with an advancing tendency. There is only a moderate demand for Steel Slabs and Rods, but a lively trade is doing in other Steel at firm prices.

**Scotch Pig.**—The volume of business has been large and prices are strong at the further advance.

No. 1 Coltness, f.o.b. Glasgow.....	56/6
No. 1 Summerlee, " ".....	55/6
No. 1 Gartsherrie, " ".....	52/6
No. 1 Langloan, " ".....	56/
No. 1 Carnbroe, " ".....	47/6
No. 1 Shotts, " at Leith.....	53/6
No. 1 Glengarnock, " Ardrossan.....	52/
No. 1 Dalmeilington, " ".....	48/
No. 1 Eglinton, " ".....	45/
Steamer freights, Glasgow to New York, 5/;	
Liverpool to New York, 10/.	

**Cleveland Pig.**—There has been a lively trade and the market is strong, with makers asking about 2/ advance. No. 3 Middlesboro', G. M. B., 39/6 @ 40/, prompt.

**Bessemer Pig.**—Large sales continue to be made and prices are again higher and the market strong. West Coast brands, mixed numbers, 49/, f.o.b. shipping point.

**Spiegeleisen.**—A fairly active trade reported at steady prices. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

**Steel Rails.**—The demand keeps lively and the market very firm. Heavy sections quoted at £4. 7/6, and light sections £4. 12/6 @ £4. 17/6, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—For these the demand has fallen off. We quote £3. 19/8 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Prices are held firmly and the demand is fairly active. Bessemer, 2½ x 2½ inch, £4. 6/8, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—There is a moderate trade only and prices are without change. Bessemer £3. 18/8, f.o.b. at N. W. England shipping point.

**Old Rails.**—No improvement noted in the demand. Tees quoted at £3. 5/ @ £3. 6/6, and Double Heads, £3. 12/6, c.i.f., New York.

**Scrap Iron.**—Demand continues moderate and prices are nominal. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—Sales are moderate and at unchanged prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin Plate.**—Business has been less active this week, but prices are very firmly held. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....	15/3 @ 15/9
IC Bessemer Steel, Coke finish.....	14/3 @ 14/6
IC Siemens.....	14/3 @ 14/6
IC Coke, B. V. grade.....	13/9 @ 14/
Charcoal Terne, Dean grade.....	12/6 @ 13/

**Manufactured Iron.**—There is still a large trade doing, and the market continues strong. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars.....	£ s. d.	£ s. d.
Common.....	@ 8 2 6	@ 5 12 6
Staff. Bl'k Sheet, singles.....	7 12 6 @	.....
Welsh Bars (f.o.b. Wales).....	5 2 6 @	5 5 0

**Copper.**—Under the influence of more active demand from consumers, the market is quite firm. The quoted prices at the close were: Bars, £40. 10/ @ £40. 15/ for spot; £40. 5/ @ £40. 10/ for three months' futures. Best Selected, £46. 10/.

**Tin.**—A larger business has been done, and the market is stronger. Straits quoted at £94. 17/6, spot, and £95. 12/6 for three months' futures.

**Lead.**—No improvement in the demand, and no material change in prices. Quoted at £12. 7/6 for Soft Spanish.

**Spelter.**—The demand slow, and business done at 5/ decline. Quoted at £16. 15/ for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Milreis (Portugal).....	51.08
Milreis (Brazil).....	54.6
Mark (Germany).....	23.8
Pounds.....	2.206
Kilogram.....	2.206
Picul.....	134.

### WEST INDIES.

**PORT OF SPAIN, TRINIDAD, March 1, 1889.**—**Asphaltum.**—A moderate export business has transpired during the fortnight at \$14.04 @ ton Boiled and \$6.84 Crude, both free on board, inclusive of export duty. January and February shipments taken together amounted to 9418 tons, against 10,000 same time last year and 2338 in 1887. **Exchange.**—Ninety days' sight on London, \$4.74 @ \$4.80.—*E. P. Masson*

### BRAZIL.

**PARA, March 29, 1889.**—**India Rubber.**—Receipts from the interior at this point since July 1, 1888, by no means exceed those of the corresponding period of the previous crop, which does not prevent prices from ruling at present below New York parity.—*Per cable direct.*

### AUSTRALIA.

**MELBOURNE, Victoria, March 14, 1889.**—**Iron.**—The tendency in our market is downward for some articles; business drags, yet importers do not feel disposed to make concessions. We quote Scotch Pig Clyde No. 1, £4; Galvanized Iron, £17. 12/6, and Fence Wire, £15. **Tin.**—Shipments from Australia and Tasmania since the 1st inst. do not exceed 150 tons.—*Per cable via London.*

### EAST INDIES.

**MANILA, March 4, 1889.**—**Hemp.**—There are buyers at \$16 @ picul, against same time last year \$7.75, equaling @ ton, cost and freight, £53. 11/, against £28. 7/6. Clearances for the United States since January 1 amount to 82,000 bales, against 39,000 in 1888. There remain loading for do 22,000, against 18,000. Cleared for England since January 1, 66,000, against

97,000; loading for do, 1000, against 10,000. Cleared for all other ports, 9000, against 17,000. Receipts at all ports since last cable, 11,000, against 8000; do since January 1, 160,000 bales, against 135,000 in 1888 and 105,000 in 1887. **Freight.**—\$7.50, against \$5. **Exchange.**—6 months' sight, 3/7, against 3/8½.—*Ker & Co., through their agent, Mr. Charles Nordhaus, 89 Water street, per cable direct.*

### SPAIN.

**BILBOA, March 16, 1889.**—**Iron Ore.**—Dealings during the fortnight have been restricted to trifles at 8/ @ 8/3 Campanil and 7/ @ 7/3 Rubios, but this might now probably be shaded. The number of steamers ready to load has diminished very much, hence the fortnight's shipments will be light. Freight meanwhile remain steady. There were shipped since January 1 854,115 tons, against 814,297 same time last year. **Pig Iron.**—Coastwise shipments for the week amounted to 130, those abroad to 521 tons, and there remain loading for Civita Vecchia two steamers.

### January Exportation of Ores and Metals from Spain.

	1887.	1888.	1889.
Tons.	Tons.	Tons.	
Calamine.....	2,290	680	681
Pyrites.....	55,831	60,395	84,059
Iron Ore.....	348,646	439,370	404,452
Pig Iron.....	12,468	1,207	8,363
Precipitate.....	3,813	2,022	8,082
Quicksilver.....	57	66	220
Pig Lead.....	11,798	12,907	10,117

Total..... 434,398 516,647 506,124

—*Bilboa Maritimo y Comercial.*

### RUSSIA.

**ST. PETERSBURG, March 20, 1889.**—**Petroleum.**—The Baku Caspia states that the German Government is about to open a consulate at that place. Mr. Deneis, a member of the firm of Burkhart & Co., large shippers, is to be appointed consul, and he will be specially instructed to facilitate the export of Russian petroleum to Germany. **Iron.**—The Russian rolling mills, in Poland in particular, are about to form a sort of counter-syndicate of consumers in opposition to the oppressive syndicate of blast furnace owners.—*Journal de St. Petersburg.*

### SWEDEN.

**STOCKHOLM, March 21, 1889.**—**Iron Ore.**—The Swedish Parliament has rejected the bill establishing an export duty on Iron Ore.—*Dagbladet.*

### GERMANY.

**HAMBURG, March 23, 1889.**—**Iron.**—Activity has been on the increase in the Rhenish-Westphalian Iron market. Pig, in particular, is in great demand and stocks rapidly being reduced, the decrease being 8000 tons in February. Spiegel is as readily taken for home use as it is for export, but no higher, the quotation remaining 63 marks for 10 to 12 %. Forge Pig was at no time as lively as it is at present, and even the Siegen makers get 55 marks for their product, orders being booked there all the way into September. Foundry Pig moves off satisfactorily at the late improvement, the range being 54 to 63; Thomas continues wanted at 47. Bessemer is also in better request at 56, German. and 47/3, English. Luxembourg Pig commands from 36 to 46 marks. Orders for Finished are booked all the way to July 1; they are nearly exclusively domestic. The weather is so mild that Structural Iron is looking up quite early this spring. Boiler Plates were seldom in brisker request, and the demand now extends to Thin Sheets. The only branch still under a cloud, besides Steel Rails, is the Wire branch. Export of Steel Rails from Germany:

	Tons.		Tons.
1876.....	133,000	1883.....	176,178
1877.....	225,000	1884.....	144,464
1878.....	207,000	1885.....	164,799
1879.....	164,400	1886.....	163,222
1880.....	230,204	1887.....	174,226
1881.....	250,709	1888.....	114,946
1882.....	186,054		

Total..... 2,334,202

Showing a steady decrease. The Dortmund quotations for Wire Rods are 114 @ 120; Steel Rails, 120 @ 128, and do. for mines, 110 @ 115 marks. **Metals.**—Lead is a little weaker, Copper dull, Spelter sustained.—*Borsenhalle.*

A society in Chili, which has for its object the promotion of all kinds of industry, and is styled the Fomento Fabril, offers a premium of 20,000 francs for the best system of flour-milling machinery. A competitive trial will take place in Santiago, the capital, in November, and as there are in Chili over 800 flour mills, the successful competitor will doubtless have

the opportunity of providing all the mills of the Republic with improved machinery. Those who wish to send their machinery, or models of machinery, to Chili, will be at no expense whatever. Freight duties and passage of the machinist to and from Chili will be paid by the society.

### The Reading Failure.

The Reading Iron Works have made a general assignment to the Reading Trust Company. It was stated by one of the creditors that the assignment would in no way interfere with the plans for reorganization if any should prove acceptable to the creditors. The assignment was made in order to prevent any preferences being secured by particular creditors. The strong feeling among many of the creditors appeared to-day that the liquidation, however much may be sacrificed, is the simplest way out of the difficulty. Frank P. Prichard, appearing for John G. Johnson, who represents the Falcon Iron and Nail Company and the Florence Mining Company, withdrew the application in the United States Circuit Court for a receivership for the Reading Iron Works. Mr. Prichard stated to Judge Butler that, in view of the fact that the Reading Iron Works would make an assignment, this course would be desirable. Several counsel representing some of the interests involved were present, but raised no objection. The court allowed the application to be withdrawn.

The Reading Trust Company met at Reading on Monday, April 1st, and arranged to assume charge of the iron works. One of the directors said, after the meeting, that under no circumstances did he think the trust would continue the business of the iron works. The company might, said the director, work up the stock and material on hand, but eventually the immense establishment would be sold to the highest bidder.

At the annual meeting of the stockholders of the Tennessee Coal, Iron and Railroad Company, 85,000 shares of the 100,000 were represented, 69,000 being voted by William Duncan for the following Board of Directors: John C. Brown, William Duncan, Sparrel Hill, Samuel Cowan, James L. Gaines, Enoch Ensler, Napoleon Hill, H. D. Bond, C. C. Baldwin, J. D. Probst, F. L. Lehman, H. D. Wood and J. C. Haskell. The board elected ex-Gov. John C. Brown president. The treasurer's report showed profits from last year making \$666,902.42, and payment *per contra* \$336,696.98 for interest, and \$40,000 on preferred stock. The capital expenditures during the year had been \$687,428.63, making a total expended on improvements since October, 1886, of \$2,154,234.86. The total assets of the company show a surplus of \$1,251,300.54 over liabilities of every kind, including capital stock, the surplus of convertible assets over the floating debt being \$437,629.81. The estimated amount of fixed charges for the ensuing fiscal year is \$420,050, embracing both interest and sinking fund.

Among recently-authorized corporations in Illinois is the United States Aluminium Company, of East St. Louis, with a capital of \$1,000,000, to manufacture Aluminium and its alloys. The incorporators are Robert M. Foster, John R. Trusdale and George C. Hackstaff.

To date 27 furnaces, representing an annual output of 903,500 tons, have signed contracts with the American Pig Iron Storage Warrant Company. In addition, companies with 25 furnaces, having a producing capacity of 685,000 tons per annum, have agreed to sign.

# Hardware.

Trade continues in fair though not heavy volume, there being more or less complaint, with the hope that in the near future there will be a decided improvement. Prices are without material change and are not characterized by especial strength. There is more or less complaint that collections are sluggish. The following statement in regard to the condition of business and the outlook for the season's trade, which comes to us from a well-known manufacturing concern of this State, expresses views which are entertained by many intelligent observers:

We see no reason why trade should not continue good for the remainder of the season. Our experience is that most buyers of Hardware have been buying from hand to mouth for several months in anticipation of lower prices. Manufacturers also have been carrying comparatively small stocks on account of decline in price of raw material. We should not be surprised to see not only an improvement in trade, but an improvement in prices, for jobbers will now find that it will be impossible for many manufacturers to fill their orders promptly, and this in turn results in jobbers being slow about filling orders from retailers. Goods will be more scarce and probably more valuable.

## Wire Nails.

The transactions in Wire Nails are of moderate extent, many of the large buyers having already placed their orders and the factories being well occupied in filling them. A good business is, however, being done, and prices remain without change.

## Cut Nails.

Pursuant to a call of the special committee the Eastern Cut Nail manufacturers met at Philadelphia yesterday to discuss the plan for pooling on which the committee has been at work for some time and the leading features of which we have alluded to in the past. It is stated that a considerable number of signatures have been secured and that the movement is making favorable progress. The New York market is beginning to feel the approach of spring in the shape of a growing volume of business, though prices continue unsatisfactory at \$1.80 for carload lots of Cut Nails on dock.

## Barb Wire.

There is more activity in Barb Wire than has recently prevailed. The prices of the Eastern manufacturers continue without change, and are well maintained on the basis of 8.5 cents for carload lots of Galvanized Four Point, 8.6 cents for 3-ton lots and 8.8 cents for smaller parcels.

## Miscellaneous Prices.

Slightly reduced prices in Shot are announced in sympathy with the condition of the Lead market. The revised quotations are as follows, subject to a discount of 2 cents per bag, 25 pounds, for cash within five days from receipt of bill:

Drop, per 25-pound bag	\$1.16
Drop, per 5-pound bag	.29
Buck and Chilled, per 25-pound bag	1.41
Buck and Chilled, per 5-pound bag	.34
Dust, per 25-pound bag	1.75
Dust, per 5-pound bag	.40

The market for Strap and T-Hinges continues low and demoralized. Competition between some of the manufacturers is especially active, others pursuing a more conservative course, and refusing to meet extreme prices.

Buffalo Forge Company, Buffalo, N. Y., issue a circular announcing that, to close out their stock of Door Butts and Builders'

Hardware, they are offering these goods at specially low prices. The circular gives prices at which Butts, Drawer Pulls, Sash Pulleys, Sash Lifts and other goods are offered, with information in regard to freight allowances, &c.

## Obituary.

Many will learn with sincere regret of the death of Edward B. Mead, who was long connected with the trade and widely known and highly esteemed. We defer a more extended reference to his life until our next issue.

P. P. Bryant, an old and prominent citizen of Centralia, Ill., and vice-president of the Centralia Iron and Nail Works, died on the 20th ult., after a very short illness.

## Nominal and Real Sizes of Coil Chain.

It is well known in the trade that a custom prevails among manufacturers of Coil and other Chains sold by the pound to furnish chain  $\frac{1}{4}$ ,  $\frac{3}{8}$ , and even, in some cases,  $\frac{1}{2}$  inch heavier than the size under which it is invoiced. This difference between the actual and nominal sizes of the Chain is an example of the apparently general tendency on the part of manufacturers to ignore the virtue of exact terms in designating goods. In the sizes of Chains more or less regularity prevails, some manufacturers making Chain of a given size slightly larger than do others, thus producing uncertainty in regard to the actual size of Chain purchased, unless the buyer is familiar with the custom of the house in this regard by whom it is manufactured. This condition of things adds force to the remark made by a prominent Chain manufacturer in this connection, that the consumer has much to learn in buying Chain. As the Chain is sold by weight, higher prices being commanded by the smaller sizes, it is natural that the manufacturers should desire to have it full size, and in its manufacture it has been for many years a general custom to have the iron of which the Chain is to be made about  $\frac{1}{4}$  inch larger than the designated size of the Chain. This custom probably grew out of allowing for the scale of the iron, the idea being that the manufactured Chain would be about the designated size. Our advice is to the effect that Chain made from such iron is, in matter of fact, slightly larger than its designation, a matter which would cause but little inconvenience or uncertainty if this standard were always adhered to. There is, however, reason to suppose that some manufacturers, under the animated competition which prevails, are making Chain from iron which is more than  $\frac{1}{4}$  inch full,  $\frac{3}{8}$  inch being frequently used, and, in some cases, probably  $\frac{1}{2}$  inch full. Well-known Pennsylvania manufacturers thus refer to the matter, explaining their adherence to the custom above mentioned and alluding to irregularities which are creeping in and the need to have something done to remedy it:

Our rule in the manufacture of Coil Chain is to roll all the iron  $\frac{1}{4}$  inch full for all sizes. That is, for  $\frac{1}{4}$ -inch Chain we would use iron rolled  $\frac{3}{8}$  inch; for 1-inch Chain,  $1\frac{1}{4}$ -inch iron, and so on throughout the list. This  $\frac{1}{4}$  inch is supposed to be about what the iron would lose when heated and worked into Chain. As our own mill rolls the iron we use, we have the grooves so turned that all iron rolled for our Chain works from  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches is rolled  $\frac{1}{4}$  full, and we expect by the time it is finished into Chain it will be about

down to correct size, so that the customer gets as near as possible what he orders. We never use exact size iron, for the simple reason that by the time it is made into Chain it would be under size. We believe that the majority of Chain manufacturers follow the same standard rule we do; yet we are sorry to often find certain parties, seemingly anxious to gain a little weight, go so far as to use iron  $\frac{1}{4}$  full, gaining but little for themselves and causing much annoyance among the trade. We believe your taking the matter up will help to remedy matters.

Referring to the irregularities thus found in the actual size of Chain, a well-known jobbing house remarks:

We presume the jobbing trade would be disposed to be somewhat lenient on this custom, realizing the very narrow margins of manufacturers, but the more acute of the retailers and consumers appear to be on the lookout for this species of deception, and in many cases refuse to have goods not running to gauge. The more scrupulous manufacturers and jobbers invariably suffer by small dishonesty of this sort on the part of competitors, but we believe it is only necessary to have the matter fully understood and the distinction properly made among the trade in order to have such abuses abolished. There is no good reason why Chains should be other than marked either as to diameter of iron, number of links to the foot in traces, &c.

As representing the usage of manufacturers of recognized position we give the following statement from a prominent Chain-manufacturing concern in New Jersey, in which they designate the sizes of iron used in making some of the leading smaller sizes of Coil Chain, stating that the larger sizes are made of iron the exact size the Chain is designated:

We make our Coil Chain of the following sizes of iron:

	Diam. in.
8-16-inch Chain, made of No. 4 Iron	0.288
$\frac{1}{4}$ -inch Chain, made of No. 1 Iron	0.300
5-16-inch Chain	11-33
$\frac{3}{8}$ -inch Chain	13-33

Larger sizes we make of iron the exact size that the Chain is designated. We have made no change in this system for many years and have not proposed to do so. We furnish the smaller sizes of Chain of exact size iron when so ordered, charging, of course, a higher price per pound for it.

The following letter from a large Chain manufacturer in Ohio alludes to the prevailing usage and an instance which has recently come to his attention, in which the complete Chain was  $\frac{1}{4}$  inch larger than its nominal size, so that it was in matter of fact 25 per cent. larger than its designation:

It has been the custom of all Chain manufacturers to make their Chain of iron  $\frac{1}{4}$  inch larger than the actual size of the Chain. This custom grew out of allowing for the scale of the iron, and it has always held good. For instance, if a party orders  $\frac{1}{4}$ -inch Chain he gets  $\frac{3}{8}$  inch; ordering  $\frac{1}{2}$  Chain he gets  $\frac{3}{4}$ . However, we are pretty well convinced that some Chain manufacturers, on the smaller sizes more particularly, use some deception.

We now have an instance of the kind before us in this way: A customer of ours in the South had a cask of Chain that he says he bought for  $\frac{1}{4}$  inch, and having no use for it opened a correspondence with the view of getting us to purchase. We took it from him presuming it was our Chain, but on receipt of same found it was made by some other manufacturer, and in place of being  $\frac{1}{4}$  inch was  $\frac{3}{8}$  inch exact. Now, the manufacturer of this Chain quite



probably did that for the purpose of getting the price of  $\frac{1}{8}$  inch for  $\frac{1}{4}$  inch iron, the iron costing him less by reason of its being a larger size than the requisite size for the usual  $\frac{1}{8}$  inch. The custom, however, is exactly as we have stated above,  $\frac{1}{8}$  full, and there are times when the iron may be somewhat in excess of  $\frac{1}{8}$  full, by reason of the rollers at the mill, who, being paid a rate for rolling upon weight turned out, will purposely roll the iron excessively large in order to get greater pay. But that is something that very seldom occurs, although we have known of instances of it.

A prominent Philadelphia house, who manufacture principally heavy Chain and

It is thus obvious that in the present condition of the market purchasers of Chain who are informed in regard to trade usages will expect to receive somewhat larger Chain than they order, and if exact sizes are desired it should be so specified at the time of purchase. They will also be on their guard to see that the excess in the size of Chain is not unduly large, especially as there is at the present time an apparent disposition on the part of some manufacturers to put on the market Chain which is heavier than accords with the established usage of reputable makers. This tendency, which is to be regretted, is one of the evils

board 2 x 8 feet, which is devoted to Eagle Locks. It contains 61 samples, and is attached to the wall. Door Locks, comprising Rim and Mortise, are sampled on 50 boxes; Knobs, 15 boxes; Padlocks, 16 boxes; Butts, 40 boxes, &c. All staple goods are sampled conspicuously, so that the customer is enabled to see at a glance the article he wants without the necessity of taking down boxes, &c. It is found that this method of complete and attractive sampling permits the waiting on customers to much better advantage, and, taking the time saved into consideration, is referred to as worth a clerk's hire annually. Fig. 325 represents a portion of a counter containing a large num-

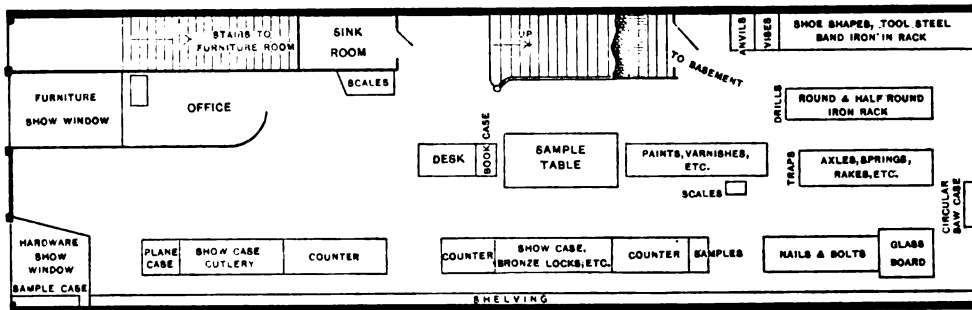


Fig. 323.—Store of L. G. Kingsley, Rutland, Vermont.

of a high quality, refer to the matter in the following terms:

The excess in size only occurs in the cheap grade of Chain. Labor and price of iron increase, as you well know, by each  $\frac{1}{8}$  inch, and much is gained by stretching this as far as the consumer will submit to. In our opinion, the evil will never be corrected in the cheaper grades, for the manufacturer must resort to some device in order to sell at a price lower than good Chain demands. Our practice is to have the iron rolled  $\frac{1}{4}$  inch full, which, after it has been heated and bent, reduces it practically to exact size. Owing to the practice of selling Chain of larger size than represented, we have been virtually driven from the market on ordinary Chain and run our

which results from the active competition which prevails, and which, unless corrected, will result in much annoyance to those who handle and use Chains, as well as to manufacturers who are compelled to meet this kind of competition.

#### Arrangement of Stores.

The illustrations given herewith, Figs. 323 to 327, represent the arrangement of the store of Levi G. Kingsley, Rutland, Vt., showing in detail some of the many convenient and ingenious devices for the accommodation of different goods. Fig. 323 gives the general arrangement of the store, the dimensions of which are 80 x 24 feet. From this diagram the location of

ber of tills or bins. The 15 bins in the three tiers shown in the cut are devoted to Steel Nails, and have a capacity of 150 pounds each. Adjoining them are bins for Horseshoes, two deep, with a capacity of 200 pounds each, and at the end of the counter are Ox Shoe bins, four tiers, with a capacity of 150 pounds each. The portion of the counter devoted to Nails is 8 feet long and 4 feet high, the tills being 20 inches deep, 13 inches high and 14 inches wide. The bottom of the bins is inclined, it will be observed, from the front to the rear. The bins open on one side only. The part of the counter devoted to Horseshoes is 10 feet long, 1 foot 9 inches deep and 1 foot 5 inches high. The bins in the Ox Shoe counter are 18 inches deep, 12 inches high and 9 inches wide. Another

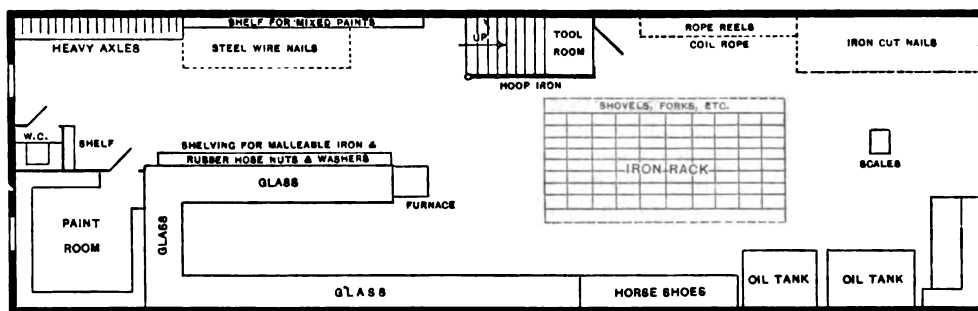


Fig. 324.—Basement of L. G. Kingsley's Store.

works almost exclusively on the higher grades.

A Western manufacturing concern write us that their Chain, from  $\frac{1}{8}$  inch to  $\frac{1}{4}$  inch, is made regularly  $\frac{1}{2}$  inch heavier than the size would indicate, thus conforming to the general usage of the trade, while above  $\frac{1}{4}$  inch their Coil Chain is of exact size. They also state that there appears to be a tendency to increase the difference between the nominal and the real sizes, and refer to their own experience in the matter, as they have recently seen Chain full  $\frac{1}{8}$  inch larger than the size indicated on the barrel, and they state they would not be surprised to see  $\frac{1}{4}$ -inch Chain sold for  $\frac{1}{8}$ -inch in the near future, as this seems to be about the only way to make a profit on Coil Chain at present.

the office, the different counters, racks, &c., will be observed, as well as other details which are of interest, the whole showing the interesting features of this establishment, some of which are not frequently found. The basement, Fig. 324, is devoted, it will be observed, to heavy goods, including Bar Iron, Horseshoes in kegs, Cut and Wire Nails, Paints and Oils, Glass, Shovels, Rope, &c. Some of the fixtures used in this part of the store are referred to and illustrated hereafter. The shelving of the store, Fig. 323, is devoted to Shelf Hardware of all kinds, including a large line of Machinists' and Blacksmiths' Tools and other goods. Green boxes are used to a large extent, the goods being sampled on the front of them. There are 473 such boxes, ranging in size from  $2\frac{1}{2}$  x 6-inch to  $4\frac{1}{2}$  x 8-inch front. Cabinet Locks are sampled on 67 small-sized boxes, there being also a sample-

counter contains a number of bins 10 x 10 x 17 inches, devoted to Strap and T Hinges, light and heavy; others 20 x 17 x 10 inches, devoted to Wrought Hook and Heavy Hinges; and Chain tills, 10 x 14 x 24 inches. These counters are located in the rear of the store, between the Nail counter and the Iron rack, as shown in Fig. 323. The Nail counter has on the outside three rows of drawers for Malleables and Nuts, and on the inside there are openings into the Nail bins, and above them drawers for Bolts and Horse Nails. The bottom of the bin descends from the front to the rear; the drawers and pigeon-holes for Malleables and Nuts run to the middle of the counter, where there is a partition. The outside of counter by this arrangement has 60 drawers and 20 pigeon-holes, and the inside 24 drawers and 23 pigeon-holes. The length of the counter is 21 feet. On the front of the counter

nearest the entrance, Fig. 323, there is a Plane case, which is used for the display of the Bailey Planes, by means of which an efficient exhibition of these goods is secured. The large show-windows on either side of the entrance are worthy of special attention, permitting, as they do, an attractive and effective display of goods. In order to protect the shelf goods from dust at night and during the cleaning of

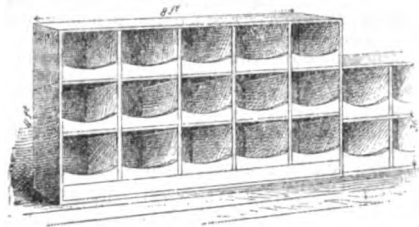


Fig. 325.—Counter with Bins.

the store, there is at the top of the shelving a curtain, which is let down when desired.

Fig. 326 illustrates the arrangement of Rope reels, which are situated in the basement, as shown in Fig. 323. The method of managing Glass is shown in Fig. 327. In this arrangement common Glass boxes are utilized. They are nailed firmly to the floor and the top box fastened by cleats and supported by braces, one of which is shown in the engraving. This is referred to as an economical and very satisfactory method of arranging Glass. When an invoice is received the Glass is placed in the proper compartment, the boxes and straw being thrown out, all broken Glass being cut into regular sizes. One advantage of this method is that the condition of the stock can readily be seen. It has been in use for a number of years, and is pronounced exceedingly satis-

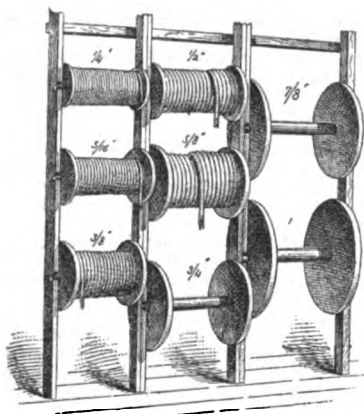


Fig. 326.—Rope Reels.

factory. The engraving represents a portion of the stock of single-thick Glass, a similar arrangement being used for double thick.

#### The Collins-Coes Wrench Litigation.

June 5, 1875, a bill of complaint was brought by the Collins Company against Loring Coes & Co., manufacturers of the Coes Wrenches, for infringement of a patent granted October 10, 1865, to Lucius Jordan and Leander E. Smith, thus beginning a protracted litigation, which has, however, been terminated by the decision of the Supreme Court of the United States. July 24, 1880, a decision was given by the Circuit Court against Loring Coes & Co., and an injunction issued against the manufacture of the Wrenches in question, and a suit was also brought by the Collins Company against A. G. Coes & Co. In this

case a decision was rendered in favor of the defendants, July, 1884, on the ground that the Jordan and Smith patent was null and void for want of novelty, and the previous decision against Loring Coes & Co. was dissolved and the bill of complaint dismissed. An appeal was then taken by the Collins Company to the Supreme Court of the United States. Their decision, which was rendered by Chief Justice Fuller, March 5, affirms the decision of the Circuit Court in holding that the Jordan and Smith patent, under which the Collins Company brought the suit, was void for want of novelty. The matter having thus been passed upon by the court of last resort is finally disposed of.

#### Items.

Edward S. Hotchkiss, Bridgeport, Conn., for whom John H. Graham & Co., 118 Chambers street, New York, are agents, is calling attention as a seasonable article to the Lemon Squeezer and Meat Press which is illustrated in his advertisement on page 84. We are advised that the demand last season was considerably in excess of the supply, but that a large stock is ready for the business of the pres-

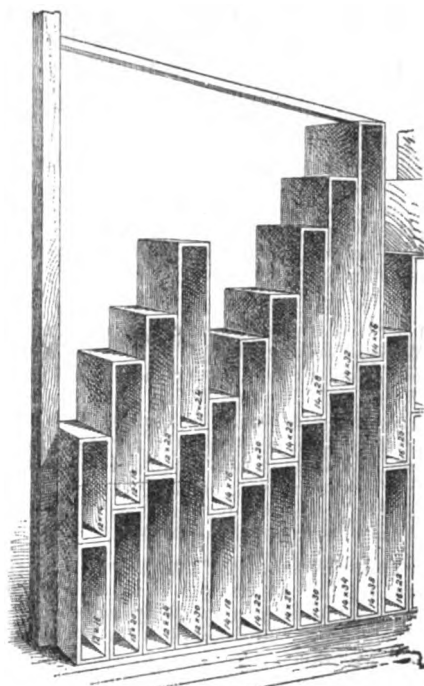


Fig. 327.—Glass Rack.

ent season, and it is intimated that orders will be promptly filled. Some changes have been made in the Squeezer to perfect it, among which may be mentioned the strengthening of the casting.

The Aetna Iron and Steel Company, Bridgeport, Conn., have issued a new price list for 1889. The list is neatly printed and well arranged, and contains much valuable information relating to their line of manufacture of Iron and Steel Bars, Rails, Shapes, Sheets and Plates, and will be found by the buyer a convenient book of reference.

Burditt & Williams, 20 Dock square, Boston, Mass., have recently been appointed sole agents in the United States for the sale of Marty's Patent French Trap, an illustration of which is given in their advertisement on page 90. It is said that in France the sales of this Trap average nearly 1000 per week, and that it is in use in the cities of Paris, Versailles, Lyons, and in the public schools, barracks, hospitals, warehouses, &c., and that it has also been doing efficient work in some cities in this country. The Trap, as will be seen from the illustration, consists of two apartments, in both of which bait is

placed, one-third of the amount being in the outer apartment, which is termed the "introducer," into which the rat first enters, and the balance being in the inner apartment, which is designated the "collector." The circular describing the Trap gives suggestions as to its use, and calls attention to its efficiency.

Sise, Gibson & Co., 100 Chambers street, New York, have recently been appointed agents for the sale of Empire Sheathing, to the quality of which special reference is made. The points made in regard to it are that it is clean to handle, water-proof, obnoxious to mice and vermin of every description, and that it will cover more space for the same money than other water-proof Sheathing. Two kinds are put on the market, No. 60, the regular article, 3 feet wide, which is furnished in rolls containing 900 square feet, and No. 70, which is much heavier and furnished in rolls of 500 square feet. The compactness of these rolls and the fact that they occupy comparatively little space for the number of yards contained in them are points made in regard to the goods.

Hunt & Connell, Hardware merchants, Scranton, Pa., are manufacturing a line of Miners' Lamps, of which they make five different styles, the bodies being the same but with different spouts. The special feature of these Lamps is that the spout and the body are of one piece of metal. The following are their different patterns:

- No. 1, Standard Miners' Lamp, Scranton spout.
- No. 2, Standard Drivers' Lamp, large spout.
- No. 3, Miners' Lamp, small spout.
- No. 4, Miners' Lamp, long spout for kerosene oil.
- No. 5, Miners' Lamp, double spout.

The firm of J. L. Colcord & Son, Peabody, Mass., was dissolved, 28th ult., by mutual consent. The business will be continued by the new firm of Buxton & Co., 77 Washington street, Salem, Mass., J. H. J. Colcord becoming an active partner in the new firm. Their business will be dealing in Seeds and Farm Implements, and they will make a specialty of growing Seed Specialties and jobbing Farm Machinery in their county. It is their intention to add a stock of Hardware in the near future, but for the present they will confine themselves to what may be called Farmers' Hardware.

W. H. Billany and J. A. Cochrane, late with the McFadden Company, Philadelphia, have formed a copartnership under the style of Billany & Cochrane, and have established an office at 704 Arch street, for the sale of Tools, Mill Supplies and Light Machinery. They invite orders for Taps, Drills, Reamers, Chucks, Screw Plates, Pipe Tongs, Wrenches, Vises, Anvils, Forges, &c.

John C. Schmidt & Co., York, Pa., manufacturers of Chain, have appointed Wier & Wilson, Baltimore, Md., their representatives for the Southern trade. They have also increased their storage capacity by the addition of a large warehouse, and advise us that they are now prepared to fill orders promptly.

J. C. McCarty & Co., 97 Chambers street, New York, have been appointed as general selling agents for the Ten Eyck Edge Tool Company, Cattaraugus, N. Y., of whose goods they will carry a stock for immediate delivery here if required. This company have been in operation since 1860, and manufacture a complete line of Axes, Hatchets, &c.

The trade will observe on page 115 the advertisement of the Stanley Rule and Level Company, New Britain, Conn., in which they illustrate the different uses of their Odd-Jobs, thus greatly facilitating the understanding of the many purposes this ingenious tool is fitted to serve.

Wallbridge & Co., Buffalo, N. Y., have issued April 1 an illustrated circular of seasonable goods. It represents Brushes, Picture Hooks, Barb Wire, Post-Hole Diggers, Picks, Wheelbarrows, Shovels, Spades, Steel Goods, Pruners, &c.

Sise, Gibson & Co. announce that after May 1 their New York address will be 118 Chambers street, instead of 100 Chambers, as at present. They have also about completed the removal of their factory to Ansonia, Conn., where they will have much improved facilities.

Among the advertisements on page 108 is one in which F. A. Tyler, Rome, N. Y., illustrates the Eclipse Vine and Plant Sprinkler. This Sprinkler, it is to be noticed, is a combination Sprinkler for water and plaster, and the principle of applying the water is by spraying it on to the hills, instead of pouring, which is referred to as doing the work very effectually. The Sprinkler being in the bottom of the can, the pressure of the water upon the Sprinkler when the valve is opened produces the spray, while there is no waste in passing from hill to hill. The method of applying the plaster is by means of a feed cup placed in the inside of the Sprinkler, with wings which are adjustable for the use of any powdered substance, and can be opened or closed to spread much or little on the hill at a time, thus giving economy in the use of material. One man can use two of these cans at a time, and it is stated that two cans filled will cover 500 hills of potatoes or other plants thoroughly and effectually. The receipt for making a poisonous fluid to be used in the water, making the whole poisonous, is pasted on each can. The economy thus secured is referred to as sufficient to pay the expense of the Sprinkler in one season. We are advised that over 15,000 of them were sold last year, and the Sprinklers are referred to as giving the best satisfaction.

Overman Wheel Company, 182 to 188 Columbus avenue, Boston, Mass., have issued their catalogue for the present year. It is a well-printed pamphlet of nearly 40 pages, illustrating the Cycles made by the company, and going with some interesting detail into the construction of the different parts. A number of Cycle Sundries are also represented, the whole making a pamphlet which will be appreciated by those for whom it is intended.

Northampton Cutlery Company, Northampton, Mass., in their advertisement on page 78 illustrate their new No. 018 beech handle Butcher Knives, for the quality of which they make high claims, and emphasize the fact that they are made of genuine Shear Steel.

C. H. Amidon, Buffalo, N. Y., issues a four-page circular illustrating ten different patterns of Braces, including Amidon's Patent Corner Brace, Second Improved Barber and others. Special attention is called to the Sleeve Braces as having no springs or complications in the jaws or socket, and as being especially durable and satisfactory. The New Eclipse Ratchet Brace and the Globe-Jawed Brace are also alluded to.

From the announcement on page 58 our readers may be advised of the progress which is being made by Des Moines, Iowa, as a manufacturing center, having already, as there stated, over 125 factories, large and small. Information is also given in regard to manufacturing concerns which have recently located there, and the advantages of the city are pointed out.

We are advised that the well-known Cabinet Hardware house of Gibson, Parish & Co., Chicago, Ill., whose establishment on Randolph street was recently destroyed by fire, are making excellent progress in the re-establishment of their business in new quarters, their temporary office being

at 84 Washington street. An impression has to some extent prevailed that they might hereafter limit their business to Cabinet Hardware, but we are authorized to state that this is not the case and that their business will cover the same lines as heretofore, viz: Cabinet and Upholstery Hardware and Upholstery Goods.

The Rake Cap Company, 798 Main street, Bridgeport, Conn., issue a card, intended to be posted in the store, calling prominent attention to their Chamberlain's Rake Cap. It alludes to the fact that it is adjustable to any Rake and saves time and labor in gathering leaves, sticks, grass, &c.

Auburn Tool Company, Auburn, N. Y., in their advertisement on page 63 illustrate the Phelps Combination Plane, an article which they are putting on the market and to the obvious advantages of which they allude.

The Springfield Bicycle Mfg. Company, 178 Columbus avenue, Boston, Mass., issue a pamphlet of nearly 50 pages describing the Springfield Roadster, emphasizing its safety against headers, and illustrating the different patterns and its more important parts. Directions are also given in regard to its use, and a number of testimonials from those who have used the machine.

It will be seen that the Medford Fancy Goods Company, of which I. Bremer is president and treasurer, 44 and 46 Duane street, New York, call attention on several different pages of this issue to their line of Dog and Cat Collars, Furnishings, &c., thus evidencing in another way the enterprise which has resulted in giving this well-known line of goods so prominent a place in the market.

B. S. Hale & Son, Malden, Mass., issue price list showing their line of Electric Wires, Cordage and Cables, Magnet Wires, Silk and Cotton Cover, and also Barb Wire and Braided Wire Picture Cord. The pamphlet, which is No. 33, is neatly printed and conveniently arranged, and contains some valuable tables in regard to the diameter, weight, length and resistance of pure copper wire and the difference between wire gauges.

Frasse & Co., 92 Park row, New York, are issuing a catalogue of nearly 600 pages containing a carefully selected list of Machinery and supplies for metal and wood workers. As usual in works of this character, there are copious illustrations representing a large and varied line of goods, and the arrangement is such as to secure a satisfactory exhibit with due regard to economy of space, thus permitting a very complete line to be shown. As a departure from the usual course in such catalogues it is to be noticed that the arrangement is alphabetical, the volume beginning with Acid Bottles, Anti-Oxidizers, Anvils, Arbors, Augers, &c., and so on through the catalogue, the goods being arranged in the alphabetical order of their names, an arrangement which will be recognized as possessing some advantages. It does not, however, obviate the utility of an index, and one is accordingly given at the close of the book which will facilitate reference to its pages. The volume will be of service to those handling and using the line of Tools shown in it, and reflects credit on the house issuing it, while it also indicates their enterprise and the extent of their business. We are advised that it will be mailed to those desiring it on receipt of \$1.

The Wenstrom Magnetic Separator recently put in at the works of the Lackawanna Coal and Iron Company, at Scranton, Pa., is doing excellent work. Running on bottom droppings from the cupolas the separator treated in 11 days 198 tons of material, yielding 35 tons 3 cwt. of iron,

carrying 90 per cent. of metal, at a cost, including coal, oil and labor, of \$2.50 per day.

## Exports.

BY BARK VORWARTS, MARCH 23, 1889, FOR BRISBANE, QUEENSLAND.

By R. W. Forbes & Son.—23 packages Hardware, 1/2 dozen Meat Choppers, 3 cases Kitchen Utensils, 18 dozen Hoes, 1 dozen Bird Cages, 3 dozen Forks, 1 dozen Dashers, 7 packages Hardware, 6 gross Polish, 4 gross Sewing Machine Oil, 985 pounds Carriage Bolts, 57 dozen Axes, 3 dozen Bench Screws, 17 dozen Spade Handles, 500 Broom Handles, 35 dozen Shovel Handles, 440 pounds Finishing Brads, 20 dozen Axes, 1 dozen Perambulators, 6 racks Churns, 10 dozen Axes, 2 dozen Forks, 1/2 gross Egg Beaters, 10 boxes Clothes Pins, 2 gross Axle Grease, 1 case Corn Mills, 3 dozen Lanterns, 6 packages Hardware, 2 gross Shade Rollers, 2 cases Carriages, 15 boxes Clocks.

By F. B. Wheeler & Co.—1 dozen Step-ladders, 10 cases Hardware, 21 Refrigerators, 7 dozen Axes, 9 gross Shade Rollers, 4 cases Hardware, 1 Refrigerator, 3 cases Plated-Ware, 46 packages Stoves and Parts, 1 case Hardware, 50 dozen Brooms, 50 dozen Brooms, 1 dozen Axes, 5 dozen Axes, 10 dozen Picks, 82 Saws, 10 dozen Axes, 11 cases Hardware, 10 Guns and Parts, 1 case Plated-Ware, 2 cases Hardware, 6 cases Stoves, 1 case Hardware, 1 case Buggies, 1 case Buggies, 6 dozen Saws, 2 dozen Hammers, 25 dozen Brooms, 6 dozen Axes, 24 dozen Handles, 7 dozen Brushes, 36 1-6 dozen Saws, 13 dozen Hammers, 13 dozen Axes, 144 dozen Handles, 10 gross Shade Rollers, 3 cases Plated-Ware, 10 cases Hardware, 21 cases Stoves, 7 1/2 dozen Saws, 15 dozen Hammers, 6 cases Hardware, 2 dozen Axes, 7 1-6 dozen Pumps, 8 dozen Picks, 72 pounds Nails, 2 cases Hardware, 12 sets Wheels, 60 pairs Roller Skates, 325 pounds Castings, 4 cases Hardware, 3 cases Windmills, 6 sets Wheels, 25 dozen Brooms, 12 dozen Hardware, 60 dozen Hardware.

By V. Basanta.—130,000 Ammunition, 30 dozen Hardware, 3 dozen Choppers, 36 dozen Stoves, 15 dozen Rifles, 2 gross Whips, 5 dozen Washboards, 1000 Handles, 3 dozen Wrenches, 18 dozen Hammers, 2 dozen Pumps, 3 gross Axle Grease, 16 Perambulators, 30 dozen Handles, 5 dozen Clocks, 112 dozen Burners, 4 dozen Lamp Goods, 24 dozen Cow Bells, 16 dozen Locks and Bars, 30 dozen Locks and Catches, 4 dozen Braces, 6 dozen Lemon Squeezers, 4 dozen Grindstone Fittings, 2 dozen Saw Sets, 1 dozen Scales, 2 gross Awl Hafts, 24 gross Tacks, 88 dozen Lamp Goods.

By R. W. Cameron & Co.—1/2 dozen Saws, 12 Ranges, 8 Corn Mills, 10 cases Shellers, 1 bundle Hoppers, 900 Spokes, 8 sets Rims, 6 pairs Shafts, 30 dozen Handles, 2050 pounds Castings.

By Winchester Repeating Arms Company.—10 Guns, 12 sets tools, 6000 Cartridges, 10,000 Paper Shells, 3000 Loaded Shells, 30 Guns, 24 sets Tools, 10,000 Cartridges, 120,000 Primers, 9000 Shells.

By A. Field & Co.—9 dozen Hammers, 1 dozen Freezers, 2 dozen Wrenches, 2 1/2 dozen Ladders, 6 dozen Squeezers, 64 pounds Stone, 3 dozen Lifters, 26 dozen Saws, 6 dozen Egg Beaters.

By Coombs, Crosby & Eddy.—28 Stoves and Parts, 18 Meat Choppers, 30 dozen Fruit Jars, 2 dozen Rolling Pins, 1 dozen Wire Traps, 1 dozen Meat Cutters, 10 dozen Tools, 26 Stoves, 1 gross Hardware.

By Reed & Barton—4 cases Plated Ware.

By Arkell & Douglas—22,400 pounds Barb Wire, 10 gross Blacking.

By Strong & Trowbridge—2 cases Rims and Hubs, 9 bundles Shafts, &c.; 1 case Axles, 1 case Axles, 1 case Hubs and Fellos, 9 bundles Rims.

By Collins & Co.—108 dozen Tools.

By New Haven Clock Company—6 cases Clocks.

By A. S. Lascelles & Co.—16 dozen Hammers, 6 dozen Axes, 48 dozen Hatchets, 1 case Lamp-ware, 1 dozen Saws.

By Seth Thomas Clock Company—5 dozen Clocks.

By Ansonia Clock Company—38 boxes Clocks.

By H. W. Peabody & Co.—416 dozen Handles, 36 cases Windmills, 8 bundles Carriage-Ware, 3 packages Traps, 2 cases Plated-Ware, 1 case Carriage-Ware, 24 cases Hardware, 4 cases Firearms, 9 cases Agricultural Implements, 112 pounds Stone, 4 packages Hardware, 2 cases Axles, 2 cases Bolts and Nuts, 1 case Agricultural Implements, 2 packages Carriage-Ware, 7 cases Hardware, 1 case Nails, 2 cases Hardware, 1 case Garden Tools, 1 case Agricultural Implements, 92 packages Hardware, 5 cases Injectors, 9 cases Drills, &c.; 2500 feet Hose, 5 cases Emery-Wheels, 5 cases Die Stocks, 53 packages Hardware, 8 packages Agricultural Implements, 5 cases Egg Filters.

### New Milk-Shake and Ice-Shaving Machines.

The Adams & Westlake Company, of Chicago, are bringing out among other seasonable goods a new milk-shake machine, an ice-shaving machine and an ice plane. Below is an illustration of the milk-shake machine, which was patented November, 20, 1888.

This machine has a cast-iron body, which is handsomely japanned, and a malleable iron top, which is finely nickel-plated. It is intended to be screwed to the floor, and is large enough for a man in a standing position to operate conveniently. It agitates the glasses with a vertical motion, secured by a crank and a pitman, the latter being clearly shown in the cut. The tops covering the tumblers are made of corrugated glass, instead of metal, so that the foam can be seen when the machine is in operation in order to stop at the right time, and also to guard against the corrosion, rust or verdigris accompanying the

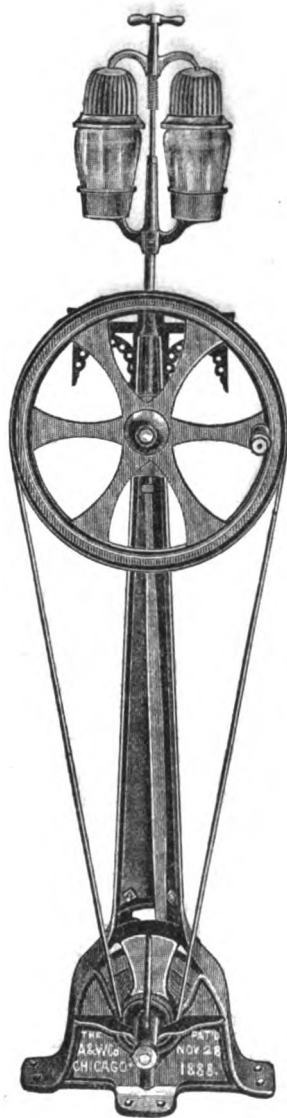


Fig. 1.—The A. & W. Milk-Shake Machine.

use of metal. The entire top is detachable, making it easy to keep the machine clean. It is operated very rapidly, a cam movement securing and releasing the glasses instantly, and special care has been taken to make it noiseless. Formulas for making drinks are inclosed with each machine.

The ice-shaving machine here shown is also new, a patent having been applied for. It is of a size suitable for counter use, and is made with cast-iron frame and galvanized body, with an outside jacket of

tin, which is artistically decorated. The base of this machine is stationary, and the top revolves by means of the toothed gearing. A knife is set in the base, and is so arranged that the ice in the revolving cylinder constantly comes in contact with it.



Fig. 2.—Ice-Shaving Machine.

An upright partition extends half way across the interior of the cylinder, to keep the ice in position to be cut, and a suitable weight is also inserted on top of the ice to keep it down. When cut it drops into the drawer below, or the drawer can be removed and glasses used in its stead. The knife can be set to cut either fine or coarse.

A less expensive ice-shaver is shown below, in the form of a hand-plane. It is

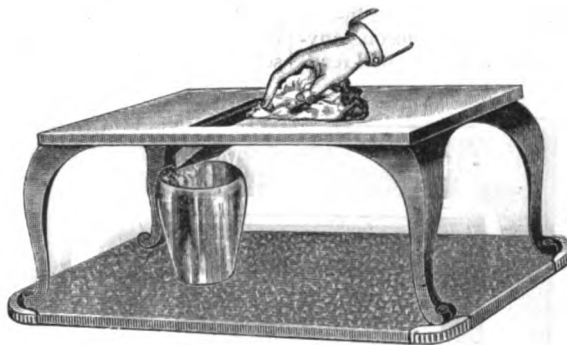


Fig. 3.—Ice-Shaver.

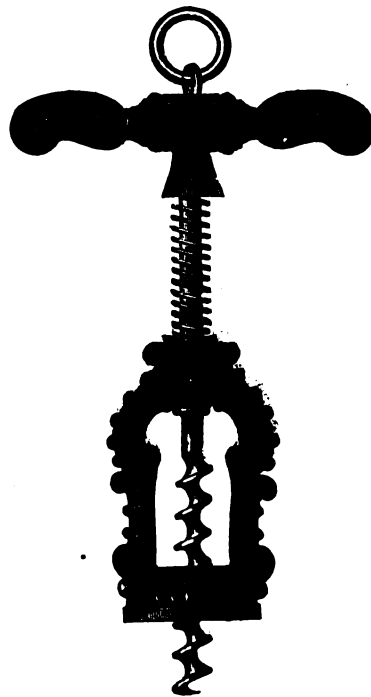
made with a cast-iron frame of ornamental appearance, and is mounted on a crystallized wood-lined board, which is a miniature stove-board. It is intended to be fastened on a counter or counter shelf.

The Michigan Sulphite Fiber Works, at Port Huron, have turned out their first completed product, consisting of 22 cords of spruce. The works have four large digesters of 22 cords capacity each and a full complement of other machinery. The buildings are heated by steam and lighted by electricity, and represent an investment of \$200,000. About 50 men are employed night and day. Julius Hess, of Detroit, was the superintending architect. There

are three other institutions of the kind in this country—at Alpena, Waterloo, N. Y., and at Detroit. The fiber is shipped in large rolls to paper mills, where it becomes the principal composition of the better grades of paper.

### Giant Self-Extracting Corkscrew.

The cut herewith given represents this article, which is one of the extended line put on the market by James D. Frary, Meriden, Conn. It is entirely of metal



Giant Self-Extracting Corkscrew.

and finished full nickel-plated or bronzed with nickel-plated screw or trimmings. The screw is described as made of best cast-steel, hardened and tempered. The operation of the spring on shank will be readily understood, and it is claimed that by means of it the hardest cork can be

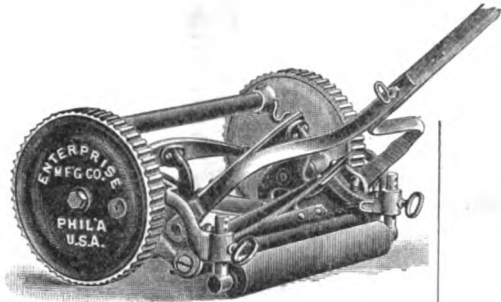
extracted without pulling. The cut represents the corkscrew half size.

Cheap living enables the Chinese in San Francisco to underbid white labor, but at the cost of a fearful mortality among themselves. Last year the death rate among Chinese, of persons of 20 years of age and over, was 20; among whites, 10.9. Of the total deaths in each class the Chinese show 90.2 per cent. above 20 years, and whites 62; under 20, Chinese 9.8 per cent., whites 3.8. These figures indicate terrible havoc. Cheap food, the custom of herding together, their willingness to live in filth and the prevalence of vice make an abnormal death rate.



**Enterprise '89 Lawn Mower.**

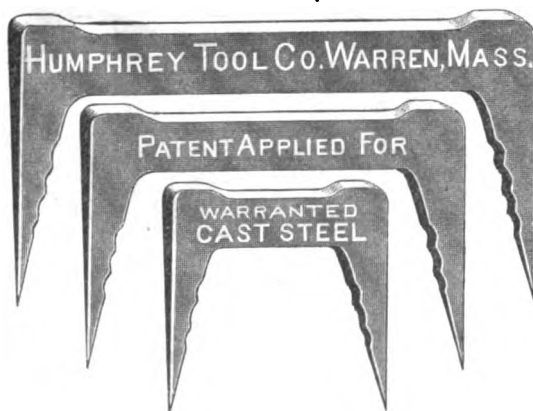
The illustration given below represents a mower put on the market for the coming season by the Enterprise Mfg. Company, Philadelphia, Pa. It will be observed that it is a rear-cut mower, with a guiding roller in the back, with a convenient and simple way of adjusting the same. The rotary-wheel contains five blades, which is referred to as securing evenness of cut, the blades being described as being made of the best hand-saw steel. The bearings are made of brass and are adjustable in case of wear by placing a piece of wire or a nail in the nut and screwing it up. Particular attention is called to the way of adjusting the height of cut. The roller is supported by two iron rods, spotted; thumbscrews enter these spots, and lowering or raising the rods regulates the distance of the

*Enterprise '89 Lawn Mower.*

blades from the ground, so that the grass may be left standing from  $\frac{1}{4}$  to  $1\frac{1}{4}$  inches high. The handle is made of wrought-iron pipe, and is pivoted at a point which is referred to as keeping the machine at its work in all positions of the handle. The dead knife may be adjusted by two set-screws on each side, thus providing for wear of the blades which may occur after long usage. This machine is made in three sizes, with width of cut 11, 13 and 15 inches, weighing respectively 29, 31 and 33 pounds. The diameter of the driving-wheels is 7 inches.

**Humphrey's Pinch Dogs.**

Humphrey Tool Company, Warren, Mass., are putting on the market a line of pinch dogs represented in the accompanying cut. They are intended, as will read-

*Humphrey's Pinch Dogs.*

ily be understood, for use by woodworkers where a joint is to be made that will not admit of using a common wood clamp or hand-screw to draw the parts together, and are put on the market in this way to obviate the necessity of having them made specially at the forge. These pinch dogs have also the advantage of being made uniform, so that in case the user desires to

remove them from the work to allow of sawing, turning or planing, they, or duplicates, may be readily reinserted. They are described as carefully formed of good steel, with spring tempered, which prevents them from bending or in any way losing shape. The corners are slightly

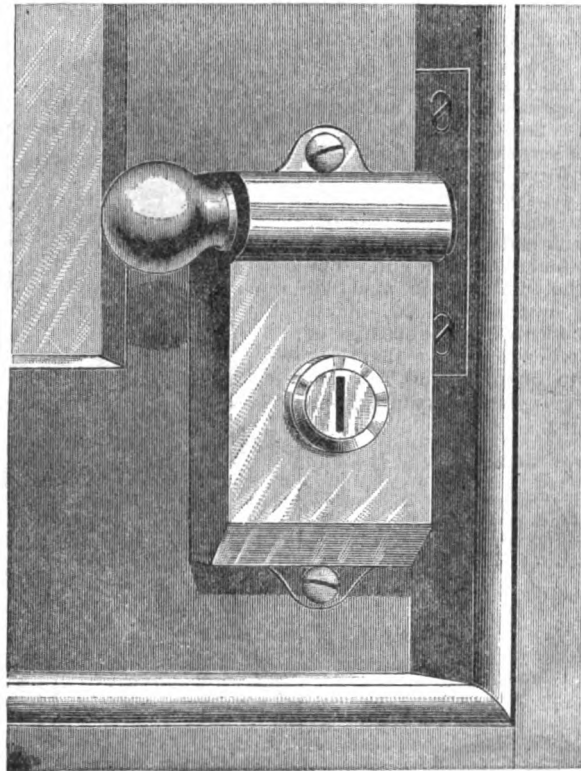
raised, that the blow from the hammer may be put where it will do the most good without danger of bending or breaking the dog. The outsides of the legs are parallel, while the insides are beveled, thus drawing the point and holding it firmly. These goods are referred to as valuable for use at the lathe, as the corrugations bed themselves closely into the wood and prevent

danger of flying out while revolving. The quality of these dogs and their practical usefulness are points which are emphasized by the company.

General Master-Workman Powderly advises short hours as a remedy for the idleness of 1,000,000 men who are willing to work if they could get it to do.

**Standard Rim-Spring Sash-Lock.**

This sash-lock is made by the Yale & Towne Mfg. Company, Stamford, Conn., and 62 Reade street, New York. It is to be observed that it is in fact a *lock* by means of which the window is securely

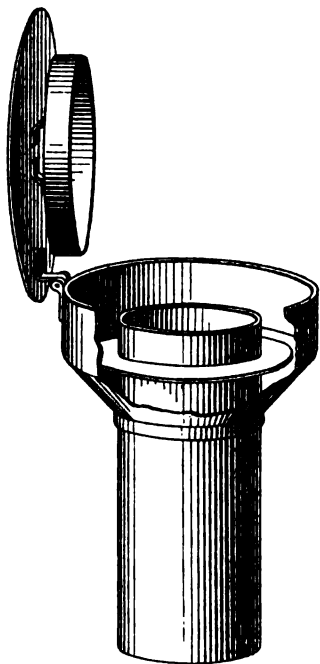
*Standard Rim-Spring Sash-Lock.*

fastened. It consists of a spring bolt engaging with a keeper placed at any desired point on the window-casing, and has a lock by means of which it can when desired be fastened securely against opening until it has been unlocked. It is obvious that security which does not attend the use of other sash fasts is thus obtained, and its convenience and the excellence of the mechanism are also referred to. The sash-lock is furnished with nickel-plated steel keys as per the illustration.

The Spanish-American Commercial Union, J. M. Ceballos, president, has been organized in this city for the promotion of trade. At a meeting for the election of directors a letter was read from President Harrison expressive of interest in its success, and among the speeches delivered was one by Warner Miller, who dealt principally with the need of the American banking facilities in the countries in question. He declared in conclusion, however, that a rapid and regular mail communication should first receive attention. "My practical experience as a legislator," he continued, "is that the only feasible way of securing this direct communication is to pay liberally for carrying the mails in American steamships. Give us a regular steamship service for one year and we will increase the business with those countries 100 per cent., if not more." Mr. Miller further dwelt upon the importance of sending the American goods in convenient packages. He predicted that if the objects of the association were carried out the United States would have 50 per cent. of the South American trade in less than four years.

### The Aspirating Ventilator.

A ventilator, a chimney cap of improved construction, was patented recently by I. J. Turner, Princeton, N. J., and is now being offered to the trade by Bur-



The Aspirating Ventilator.—Fig. 1—Ordinary Form with Hinged Cap.

ger & Lee, 376 Greenwich street, New York. The device is the result of extended investigation on the part of the inventor, who claims to have designed a ventilator of simple construction and possessing exceptional aspirating power. At the last exhibition of the American Institute it was awarded the medal of excellence. In Fig. 1 is presented a broken view of the usual form of the ventilator provided with a hinged cap or top. This style is especially recommended where soft coal is used, as it permits the chimney to be cleaned out readily, but the common

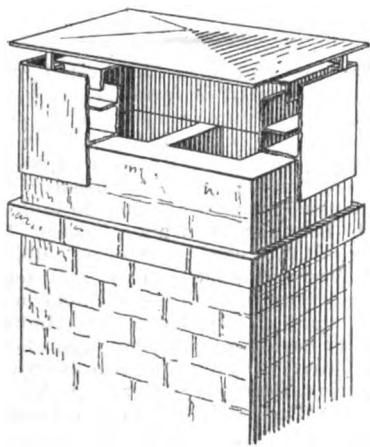


Fig. 2.—Ventilator as Applied to a Square Chimney.

form of the ventilator is of the same construction except that it has a fixed top. By referring to the engraving it will be noticed that there is an annular flange encircling the smoke-pipe near the top. Surrounding it is a cone-shaped jacket, somewhat larger in diameter than the flange, and which projects a short distance above the top of the pipe. The flat top is supported above the jacket and carries underneath a cover, the sides of which are about on a level with the top of the chimney-

pipe. By means of the intercepting flanges and rings the currents of air are prevented from passing down the chimney, and made to strike in such a direction that a suction is produced and the smoke exhausted. The construction of the ventilator is such that it may be adapted to chimneys of any shape, Fig. 2 showing a square chimney provided with an aspirating ventilator. Fig. 3 is a form of the ventilator especially

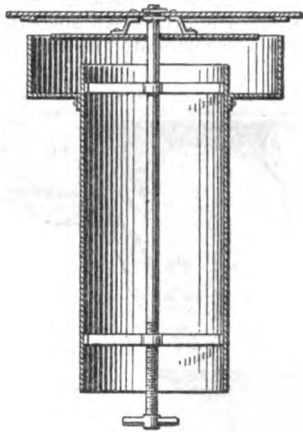


Fig. 3.—Ship Ventilator.—Inside Adjustment.

adapted for use on yachts or steamships. By means of the central rod the top can be raised any desired amount, or in case of rough weather closed entirely. The rod is of such length and so arranged that the regulation can be effected from the cabin. Fig. 4 is another form of ship ventilator, the regulating device, as indicated, being on the outside. It is intended for ven-

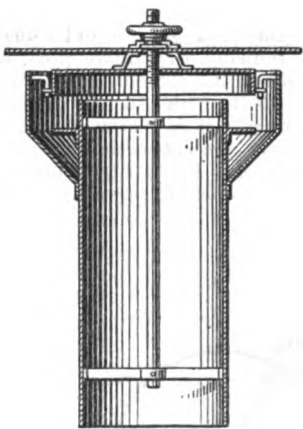


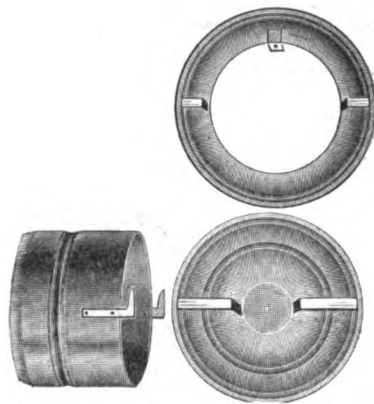
Fig. 4.—Ship Ventilator.—Outside Adjustment.

tilating engine-rooms, stoke-holes and the lower compartments of a ship. The ventilator shown in Fig. 3 does not prevent down draft under all circumstances, certain parts being omitted for reasons of economy. The other ship ventilator, however, embodies the same principle as in the ones used on house chimneys.

### Superior Thimble, Cap and Collar.

W. W. Gelatt & Son, 239 Ogden avenue, Chicago, Ill., have recently placed upon the market what they are pleased to term the Superior thimble, cap and collar, an illustration of which is presented in the accompanying engraving. The thimble is beaded and crimped and so made as to render it less liable to be pressed out of shape in setting, while causing it to engage more firmly with brickwork. The hooks on the thimble constitute a secure fastening to which the cap,

collar or pipe is attached. This avoids the necessity of driving nails in the walls and ceilings for that purpose. The attachments on the cap and collar engage firmly with the hooks on the thimble, holding



Superior Thimble, Cap and Collar

them securely against the wall and making a very tight joint. The collar is so constructed as to act as a reducer, diminishing the hole to any size desired. The hooks, it is claimed, can be put into thimbles already in the building, making it possible to use the caps and collars manufactured by the company above referred to. The goods are shipped one-third gross to a crate, which occupies a space of 14 x 36 inches and weighs 45 pounds.

### Giant Lightning Ice-Cream Freezer.

This freezer, which is manufactured by the Shepard Hardware Company, Buffalo, N. Y., is represented in the accompanying illustration. The freezer has the well-known dasher which revolves on its journal-bearings when the can turns, forcing the cream from the center to the circumference of the can, and thus securing, it is claimed, quick freezing and

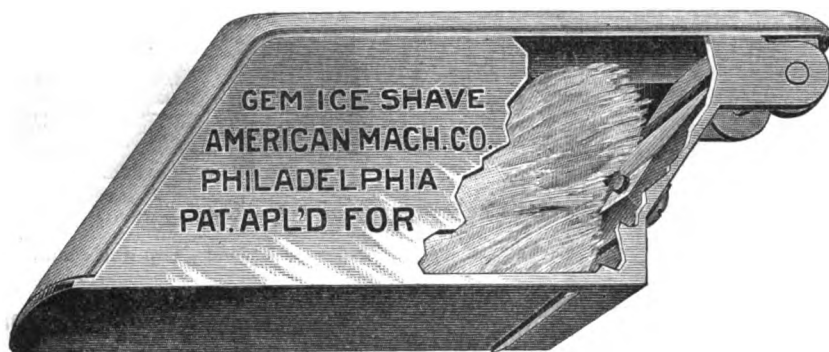


The Giant Lightning Ice-Cream Freezer.

making more ice-cream from a given quantity of cream than other freezers. The Giant Lightning is made at present in 14 and 20 quart sizes, and it is expected that larger sizes will be put on the market next year. It is made extra heavy, the can being made from 4X tin. It will be seen that the freezer has a hinged top, which can be entirely removed if desired.

### The Gem Ice-Shave.

This article is made by the American Machine Company, Philadelphia, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are agents. As shown in the cut, it is constructed like an ordinary plane made of galvanized cast iron, the interior of which is a receptacle closed by a lid in which the shaved ice collects as the tool is shoved forward and backward over the surface of a block of ice. Being quite short, its extreme length being 6 inches, the point is made that it



*The Gem Ice-Shave.*

can be used conveniently on a block of ice as it lies in the refrigerator. The ice thus planed is referred to as being as fine as snow, and, the lid being raised, it can be emptied conveniently into a glass. By means of a set screw at the back of the plane the knife can be set further in or out, thus regulating the fineness of the ice shaved off. The circular of the company indicates different uses to which the ice thus planed can be put.

### The New Mail Safety.

William Read & Sons, 107 Washington street, Boston, Mass., manufacturers of the New Mail bicycles, which have been so widely sold, have this year brought out a Safety having special features, many of



*The New Mail Safety.*

them the same as those which are found in their regular bicycles. This new machine is represented in the accompanying illustration. The point is made that it is the only Safety having the Trigwell ball head, which is referred to as a great aid in regular steering, as it does not allow sensitiveness, which has been the great fault heretofore of this type of wheel. Its spring fork is a direct vertical spring to obviate vibration and the effects of concussion, and is alluded to as having the advantage of giving no side rocking spring motion, which, the manufacturers claim, makes unsteadiness of riding and steering. It has also the band-brake on the axle of the rear wheel, which is referred to as very simple and effective and not liable to be clogged with mud, as is the

spoon brake. The handle bars are pretty well back to the rider, as shown in the illustration. The machine is described as handsomely built and meeting with a wide sale.

The Pennsylvania Railroad Company, which have been devoting considerable attention to substituting metallic for wooden ties, are likely soon to give a fair test to a new invention. The tie is a steel rectangular shell, with wooden blocks directly under the rails. An aperture large enough to accommodate the rail is cut in

the shell, so that the rail rests directly on the wood. The advantage of this combination of steel and wood is that the rail has the necessary cushion bed, while the wood is protected from the weather. It is impossible for the track to spread, and the wooden blocks, or rail seats, can be changed without disturbing the ballast. It is said that the new tie will cost only about double the price of the ordinary wooden tie and will last fully ten times as long.

The American Marine and Canal Propeller Company, of Philadelphia, have on exhibition at the Stevens House, 27 Broadway, a small model of the Bender propeller, which, it is claimed, will revolutionize the present method of propelling steam vessels. Its distinguishing feature is that the propelling power is in the center

of the vessel and always below the waterline, enabling the boat to ride heavy swells with ease, saving all the power and doing away with the necessity of a marine governor. It also dispenses with the heavy shaft and boxes which accompany the ordinary propeller, affording greater storage room and offering the advantage of concealment of the motive power.

The A. J. Hartford Steel Railway Tie Mfg. Company, of Temple Court, New York City, have closed a contract with the Pennsylvania Steel Company for the manufacture of the Hartford tie. Arrangements will be made also within a few months for the manufacture of this tie in the West. Several orders are booked, and it is expected that they will be filled speedily.

### The Decline of Philadelphia's Export Trade.

As already noticed in these columns, a sub-committee representing the three commercial bodies in Philadelphia have made a thorough inquiry into the causes of the extraordinary decline in the export trade of that port during the last two or three years, and have submitted a preliminary report. The general conclusion reached is that the falling off is due chiefly to discriminating railroad charges on grain, to the advantage of Baltimore. A first important development is that while Philadelphia had in 18 years—1860 to 1877, inclusive—an average of 7.17 per cent. of all the foreign export trade going out from the five principal Northern seaports—Boston, New York, Philadelphia, Baltimore and Norfolk—which had increased to 11.2 per cent. in 1877, it decreased from the last-mentioned year to 6.3 per cent. in 1888—a loss of nearly one-half. Another fact is the significant decrease in the arrivals and (unloaded) departures of transient foreign steamers at and from the port of Philadelphia. Philadelphia's proportion of grain exports to foreign countries in the years 1878, 1879 and 1880 was 16.5, 14.1 and 11.9 per cent. respectively, based upon the total grain exports of seven principal Northern ports. This proportion fell in 1888 to 3.4 per cent. In 1879 Philadelphia exported 31,000,000 bushels of grain, while in 1888 she exported but 1,809,000 bushels. Another significant fact is the decrease of transient foreign steamers touching at Philadelphia, or going away unloaded to get their east-bound cargoes at other ports. Only three years ago 322 such steamers came to the port of Philadelphia; but in 1888 these decreased to 195, and during the last three years more than 60 per cent. of the rapidly diminishing number of such arriving steamers bringing inward cargoes has been compelled to leave in ballast. To fully comprehend the reduction it is needful to observe that during the period covered by the foregoing there has been a marked increase of the import trade, showing inferentially that the interests of Philadelphia are in some way prejudiced by influences that are artificial and abnormal, rather than by a change of natural conditions in the course of trade. Possibly here is a case for the Interstate Commerce Commission.

The vast region in the United States where the rainfall is insufficient for successful agriculture comprises about two-fifths of our entire area (exclusive of Alaska). It aggregates about 1,200,000 square miles, and is about equal to the combined areas of Great Britain and Ireland, Belgium, Denmark, France, Germany, Italy, Sweden, Norway, Holland and Austro-Hungary. This arid region embraces nearly all the public domain and is a third larger than British India, a country having many similar physical characteristics. Arguing in favor of artificial irrigation, Senator Stewart, of Nevada, says: "The most populous nations of ancient times occupied the arid regions of Asia, Africa, and Europe, and subsisted by agriculture prosecuted by irrigation. It is estimated that there are 6,500,000 acres of land now cultivated by irrigation in the United States, varying in value from \$40 to \$1000 per acre, and yielding a net income equal to the interest on a much larger sum than this valuation."

Zacharist Chaffee, president of the Builders' Iron Foundry, in Providence, and trustee of the Sprague estate, died in that city, 30th ult., aged 74 years. He was officially connected with several local institutions. For 20 years he was an active business man in Pittsburgh.

# CURRENT HARDWARE PRICES.

APRIL 3, 1889.

*Notes.*—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.

Caps, Percussion, N 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	55¢
E. B. Grnd. Edge, 1-10's	75¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	50¢
G. D.	25¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	55¢
Cent. Fire Ground	75¢
Dbl. Waterproof	1.40
Dbl. Waterproof, in 1-10's	1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	1.60

Cartridges.	
Rim Fire Cartridges	50¢
Rim Fire Military	55¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sports	25¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., 1.75	2¢
Blank Cartridges, 32 cal., 1.85	2¢
Primed Shells and Bullets	15¢
B. B. Caps, Round Ball, 1.75	2¢
B. B. Caps, Con. Ball, Swgd., 2.00	2¢
Primers—	
Berdan Primers, (Sturtevant Shells) 1.00	2¢
B. L. Caps (for Sturtevant Shells) 1.00	2¢
All other Primers, 1.20	2¢

Shells—	
First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge (10 list)	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Seibold's Comb. Shot Shells	15¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢
I. X. L., 10 and 12 gauge	40¢
"Special," 10 and 12 gauge	30¢
"Special," 10 and 12 gauge	40¢
Fowler's Pat.	35¢

Shells Loaded—	
A. M. Co. List No. 19, 1887	20¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up	2.00
U. M. C. & W. R. A.—B. E., 9&10	2.30
U. M. C. & W. R. A.—B. E., 7&8	2.60
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9&10	4.00
U. M. C. & W. R. A.—P. E., 7&8	4.90
Eley's B. E., 11 up	1.75
Eley's P. E., 11 up	2.80

Anvils—	
Eagle Anvil, 10¢	20¢
Peter Wright's	85¢
Armstrong's Mouse Hole	85¢
Armstrong's Mouse Hole, Extra 11	1.10
Trenton	1.10
Wilkinson's	1.10
J. & Riley Carr, Pat. Solid	1.10
Moore & Barnes Mfg. Co.	33¢

Anvil Vise and Drill—	
Millers Falls Co., 18.00	30¢
Cheney Anvil and Vise	25¢
Allen Anvil and Vise, 35.00	40¢

Apple Parers—	
Advance	50¢
Antrim Combination	50¢
Baldwin	50¢
Champion	75¢
Eureka, 1888	each 17.00
Family Bay State	12.00
Gem	5.25
Gold Medal	4.00
Hudson's New '88	8.75
Ideal	8.00
Improved Bay State	4.75
Little Star	5.00
Monarch	13.50
New Lightning	5.50
Oriole	4.00
Penn	4.00
Perfection	4.00
Pomona	4.00
Rocking Table	6.00
Turntable	6.00
Victor	13.50
Waverly	4.50
White Mountain	4.50
72	4.25
78	4.50

Augers and Bits—	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	70¢
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55¢
Cook's, N. H. Copper Co.	50¢
Ives' Circular Lip	60¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	30¢
hip	40¢
C. E. Jennings & Co., No. 30	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 32 1/4 quaters, No. 5, 35; No. 30, 35.50	20¢
Lewis' Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢
Pugh's Black	60¢
Car Bits	50¢
L Hommedieu Car Bits	15¢
Fortner Pat. Aug Bits	10¢

## Hollow Augers—

Ives'	
French, Swift & Co.	25¢
Douglas	25¢
Bonney's Adjustable, 1/2 doz 48	40¢
Stearns	20¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	30¢
Wood's	25¢

## Expansive Bits—

Clark's small, 18; large, 26	35¢
Ives' No. 4, 1/2 doz 80	40¢
Swan's	40¢
Stearns, No. 1, 26; No. 2, 22	35¢
Stearns' No. 2, 48	20¢

## Gimlet Bits—

Common	25¢
Diamond	1.10
Bee	25¢
Double Cut, Sheppardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, 1/2 gro.	85¢
Double Cut, Douglas's	40¢
Double Cut, Ives'	60¢

## Bit Stock Drills—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

## Ship Augers and Bits—

L'Hommiedieu's	15¢
Watrous'	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

## Awl Hafts—

Sewing, Brass Fer. 1/2 gr, 35.50	45¢
Pat. Sewing, Short, 1.00 1/2 doz	40¢
Pat. Sewing, Long	1.00
Pat. Peg, Plain Top	1.00
Pat. Peg, Leather Top	1.10

## Awls, Brad Sets, &c—

Awls, Sewing, Common 1/2 gr \$1.70, 35¢	
Awls, Should. Peg. 1/2 gr \$2.45, 40¢	
Awls, Pat. Peg. 1/2 gr 35¢	
Awls, Shouldered Brad, 1/2 gr	35¢
Awls, Handled Brad, 1/2 gr	45¢
Awls, Handled Scratch 1/2 gr, 75¢	35¢
Awls, Socket Scratch, 1/2 doz, 1.50	25¢

## Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00	55¢
Fraser's Adj. Tool Hds., Nos. 1, 12; 2, 18; 3, 12; 4, 20	25¢
Miller's Falls Adj. Tool Hds.	25¢
Nos. 1, 12; 2, 18	25¢
Henry's Combination Haft	25¢
Brad Sets	
No. 42, 10.50; No. 43, 12.50	70¢
Stanley's Excelsior	
No. 1, 7.50; No. 2, 4.00; No. 3, 5.50	30¢

## Axes—

### Makers' and Special Brands—

First quality	50¢
Others	55¢

## Axle Grease—

Fraser's	50¢
Fraser's in boxes	50¢
Dixon's Everlasting, in 1/2 doz	1.20
Dixon's Everlasting, 10-12 pails, ea. 85¢	
Lower grades, special brands	70¢

## Axles—

No. 1	4¢
Nos. 7 to 14	5¢
Nos. 15 to 18	7¢
Nos. 19 to 22	7¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5)	35¢
Less than 10 sets	35¢
Over 10 sets	35¢

## Bag Holders—

Sprengle's Pat.	60¢
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## Balances—

Spring Balances	50¢
Common 24-lb	50¢
Chatillon's Spring Balances	50¢
Chatillon's Circular Spring Balances	60¢

## Bells—

### Hand—

Light Brass	70¢
Extra Heavy	60¢
White Metal	60¢
White Chime	35¢
Globe (Cone's Patent)	25¢

### Door—

Gong, Abbe's	35¢
Gong, Yankee	45¢
Gong, Barton's	40¢
Crank, Taylor's	25¢
Crank, Brooks'	50¢
Crank, Cone's	10¢

Crank, Connel's	30¢
Lever, Sargent's	50¢
Lever, Taylor's Bronzed or Plated	50¢
Lever, Taylor's Japanese	25¢
Lever, B. E. M. Co.'s	50¢
Pull, Brook's	50¢
Pull, Western	25¢

## Common Wrought—

Western	30¢
Western, Sargent's list	70¢
Kentucky, "Star"	20¢
Kentucky, Sargent's list	70¢
Dodge, Genuine Kentucky	70¢
Texas Star	50¢
Call	40¢
Farm Bells	50¢
Steel Alloy Church and School Bells	40¢

## Bellows—

Blacksmiths'	50¢
Molders'	40¢
Hand Bellows	50¢

## Belting, Rubber—

Common Standard	70¢
Standard	70¢
Extra	60¢
N. Y. B. & P. Co., Carbon	60¢
N. Y. B. & P. Co., Diamond	50¢

## Bench Stops—

Morrill's	50¢
Hotchkiss's	50¢
Weston's, No. 1, 10; No. 2, 20	25¢
McGill's	50¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension	
Barber's, 1/2 doz \$15.00	40¢
Ives, 1/2 doz \$20.00	60¢
Diagonal	50¢
Angular	50¢

## Blind Adjusters—

Domestic	50¢
Excelsior	50¢
Washburn's Self-Locking	20¢

## Blind Fasteners—

Mackrell's, 1/2 doz, 1.00	20¢
Van Sand's Old Pat., 15.00 1/2 gr	55¢
Washburn's Old Pattern	50¢
Merriman's	50¢
Austin & Eddy No. 2008	50¢
Security Gravity	50¢

## Blind Staples—

Barbed, 1/2 in. and larger, 1/2 doz	75¢
Barbed, 3/4 in.	85¢

## Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

## Bolts—

### Door and Shutter—

Cast Iron Barrel, Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	65¢
Ives' Patent Door Bolts	60¢
Wrought Barrel Bolts	70¢
Wrought Square Bolts	70¢
W. R. Shutter, all Iron, Stanley's	60¢
W. R. Shutter, Brass Knob	40¢
W. R. Shutter, Sargent's list	60¢
W. R. Sunk Flush, Sargent's list	55¢
W. R. Sunk Flush, Stanley's list	50¢
W. R. B.K. Flush, Com'n	55¢

### Carriage, Machine, &c.—

Com. list June 10, '84	75¢
Genuine Eagle, list Oct. '84	75¢
Phila. pattern, list Oct. '74, '84	75¢
R. B. & W., old list	70¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢

## Nuts—

Common, list Feb. 23, '83	70¢
Port Chester Bolt and Nut Company	
Empire, list Feb. 23, '83	70¢
Phila., list Oct. '84	85¢
Keystone, Philadel., list Oct. '84	85¢
Norway, Phila., list Oct. '84	75¢
American Screw Company	
Norway, Phil., list Oct. 15, '84	75¢
Eagle, Phil., list Oct. 15, '84	80¢
Phila., list Oct. 15, '84	82¢
Bay State, list Feb. 23, '83	70¢
R. B. & W., Philadel., list Oct. 15, '84	82¢

## Stove and Plow—

Stove	65¢
Plow	60¢
R. B. & W., Plow	55¢

## Borax—

1/2 doz	9¢
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## Boring Machines—

Without Augers	
Douglas	50¢
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Machines	2.35
Phillips' Patent with Augers	7.00

## Bow Pins—

Humason, Beckley & Co.'s	50¢
Sargent & Co.'s	50¢
Peck, Stow & W. Co.	50¢

## Braces—

Barber's	
Nos. 10 to 16	50¢
Nos. 30 to 33	40¢
Nos. 40 to 63	50¢
Barker's	
Nos. 5, 10 and 12	75¢
Plated, Nos. 8, 10 and 12	65¢
Osgood's Ratchet	40¢
Spofford's	50¢
Ives' New Haven Novelty	70¢
New Haven Ratchet	60¢
Barber Ratchet	60¢
Barbers	60¢
Spofford	60¢
Common Ball, American	1.10
Bartholomew's	
Nos. 25, 27 and 30	50¢
Nos. 117, 118, 119	70¢

Amidon's	
Barker's Imp'd Plain	75¢
Barker's Imp. Nickel	65¢
Ratchet	75¢
Eclipse Ratchet	60¢
Globe Jawed	40¢
Corner Brace	40¢
Universal, 8 in., 22.10; 10 in.	22.25
Buffalo Ball	1.10
P. S. & W.	50¢

## Brackets—

Shelf plain, Sargent's list	55¢
Shelf, fancy, Sargent's list	60¢
Reading, plain	50¢



**Cards—**  
Horse & Curry.....10&10&10&10&10  
Cotton.....10&10&10  
Wool.....10&10&10

### Carpet Stretchers—

Cast Steel, Polished.....\$ doz \$2.25  
Cast Iron, Steel Points.....\$ doz 80¢  
Socket.....\$ doz \$1.75  
Bullard's.....25¢@25¢10¢

### Carpet Sweepers—

Bissell No. 5.....\$ doz \$17.00  
Bissell No. 7 New Drop Pan.....\$ doz \$19.00  
Bissell, Grand.....\$ doz \$36.00  
Grand Rapids.....\$ doz \$24.00  
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00  
Magic.....\$ doz \$15.00  
Jewel.....\$ doz \$17.00  
Improved Parlor Queen, Nickel.....\$ doz \$37.00  
Improved Parlor Queen, Japanned.....\$ doz \$24.00  
Excelsior.....\$ doz \$22.00  
Garland.....\$ doz \$18.00  
Parlor Queen.....\$ doz \$24.00  
Housewife's Delight.....\$ doz \$15.00  
Queen.....\$ doz \$18.00  
Queen, with band.....\$ doz \$18.00  
King.....\$ doz \$30.00  
Weed, Improved.....\$ doz \$18.00  
Hub.....\$ doz \$10.00  
Cog Wheel.....\$ doz \$22.00  
Conqueror.....\$ doz \$22.00  
Easy.....\$ doz \$22.00  
Monarch.....\$ doz \$22.00  
Goshen.....\$ doz \$21.00  
Advance.....\$ doz \$18.00  
Ladies' Friend, No. 1, \$ doz, \$15.00; No. 2, \$ doz, \$18.00  
American.....\$ doz \$15.00  
Grand Republic.....\$ doz \$35.00

### Cartridges—

See Ammunition.

### Casters—

Bed.....} New list:  
Plate.....} Brass.....55¢@55¢5¢  
Shallow Socket.....} Others.....60¢@60¢5¢  
Deep Socket.....40¢10¢  
Yale Casters, list May, 1884.....30¢10¢@40¢  
Yale, Gem.....60¢@60¢5¢  
Martin's Patent (Phoenix).....45¢10¢@50¢  
Payson's Anti-friction.....60¢@60¢10¢  
Giant Truck Casters.....50¢10¢  
Stationary Truck Casters.....50¢10¢  
Socket Truck Casters.....50¢

### Cattle Leaders—

Humason, Beckley & Co.'s.....70¢  
Sargent's.....60¢@10¢  
Hotchkiss.....30¢  
Peck, Stow & W. Co.....50¢10¢

### Chain—

Trace, 6-10-2, exact.....50¢10¢@50¢10¢5¢  
Trace, 6-10-3, exact.....50¢10¢@50¢10¢5¢  
Trace, 6-10-4, exact.....50¢10¢@50¢10¢5¢  
Trace, 7-10-2, exact.....50¢10¢@50¢10¢5¢  
Trace, 7-10-3, exact.....50¢10¢@50¢10¢5¢  
Trace, 7-10-4, exact.....50¢10¢@50¢10¢5¢  
NORZ—Traces, Regular" sizes, 3¢ net  
Log Fifth Stretcher, and other fancy  
Chains, list Nov. 1, 1884.....50¢10¢@50¢10¢5¢

American Coll. in cask lots,  
3-16 1/2 5-16 3/4 7-16 1/2 5¢ 3¢  
\$8.75 6.25 5.00 4.50 4.00 3.75 3.50  
Less than cask lots, add 1/4¢@1/2¢  
German Coll. list of June 20, 1887.....50¢10¢@50¢10¢5¢

German Halter Chain, list of June 20, 1887.....50¢10¢@50¢10¢5¢  
Covert Halter, Hitching and Breast.....50¢2¢  
Covert Traces.....35¢@2¢  
Oneida Halter Chain.....60¢@60¢5¢  
Galvanized Pump Chain.....\$ doz \$4.50  
Jack Chain, Iron.....75¢@75¢5¢  
Jack Chain, Brass.....70¢@70¢5¢

### Chalk—

White.....\$ gr 50¢  
Red.....\$ gr 70¢  
Blue.....\$ gr 85¢  
White Crayons, \$ gr 12¢@12¢1/4¢.....10¢

### Chalk Lines—

See Lines.

### Chisels—

Socket Framing and Firmer.  
P. S. & W.....75¢@75¢10¢  
New Haven.....75¢@75¢10¢  
Wetherby.....75¢@75¢10¢  
Mix.....75¢@75¢10¢  
Ohio Tool Co.....75¢@75¢10¢  
Douglas.....75¢@75¢10¢  
Buck Bros.....30¢  
Merrill.....60¢10¢@60¢10¢5¢  
L. & J. J. White.....30¢@30¢5¢

### Tanged and Miscellaneous.

Tanged Firmer.....40¢10¢  
Butcher's.....\$4.75@5.00  
Spear & Jackson's.....\$5 to 2  
Buck Bros.....75¢@75¢5¢  
Cold Chisels, \$ doz.....10¢10¢

### Chucks—

Beach Pat.....each \$8.00.....20¢  
Morse's Adjustable, each, \$7.00, 30¢@20¢5¢  
Danbury.....each, \$6.00, 30¢@30¢5¢  
Syracuse, Balz Pat.....25¢

### Clamps—

R. I. Tool Co.'s Wrought Iron.....25¢  
Adjustable, Gray's.....20¢  
Adjustable, Lambert's.....20¢  
Adjustable, Snow's.....40¢5¢  
Adjustable, Hammers.....15¢  
Adjustable, Steam's.....20¢10¢  
Steam's Adjustable Cabinet and Cor-  
ner.....20¢10¢  
Cabinet, Sargent's.....60¢@10¢  
Carriage Makers', Sargent's.....70¢10¢  
Eberhard Mfg. Co.....40¢5¢@10¢10¢  
Warner's.....40¢10¢@40¢10¢5¢  
Saw Clamps, see Vises

### Clips—

Norway, Axle, 1/4 & 5/16.....55¢5¢5¢  
2nd grade Norway Axle, 1/4 & 5/16.....65¢5¢  
Superior Axle Clips.....60¢@5¢60¢5¢5¢

Norway Spring Bar Clips, 5-16, 60¢5¢5¢  
Wrought-Iron Felloe Clips.....\$ doz 5¢  
Steel Felloe Clips.....\$ doz 5¢  
Baker Axle Clips.....25¢

### Cockeyes—

Cocks, Brass.....40¢10¢2¢  
Hardware list.....40¢10¢2¢

### Coffee Mills—

Box and Slide, list Jan. 1, 1888.....50¢2¢  
American, Enterprise Mfg Co. 20¢10¢@30¢  
The Swift, Lane Bros.....20¢10¢

### Compasses Dividers, &c—

Compasses, Calipers, Dividers, 70¢@70¢10¢  
Bemis & Call Co.'s.....60¢5¢  
Dividers.....60¢5¢  
Compasses & Calipers.....50¢5¢  
Wing and Inside or Outside.....50¢5¢  
Double.....60¢  
(Call's Pat. Inside).....30¢  
Excelsior.....50¢  
J. Stevens & Co.'s.....25¢10¢  
Starrett's.....25¢10¢  
Spring Calipers and Dividers 25¢10¢10¢  
Lock Calipers and Dividers.....25¢10¢  
Combination Dividers.....25¢10¢

### Coopers' Tools—

Bradley's.....20¢  
Barton's.....20¢@20¢5¢  
L. & J. J. White.....20¢5¢  
Albertson Mfg. Co.....40¢@40¢5¢  
Beatty's.....40¢@40¢5¢  
Sandusky Tool Co.....30¢@30¢5¢

### Corkscrews—

Humason & Beckley Mfg. Co. 40¢@40¢10¢  
Clough's Pat.....35¢@35¢4¢5¢  
Howe Bros & Hulbert.....35¢

### Cork Knives and Cutters—

Bradley's.....10¢  
Wadsworth's.....25¢

### Cradles—

Grain.....50¢2¢

### Crow Bars—

Cast Steel.....\$ doz 4¢  
Iron, Steel Points.....\$ doz 3 1/4¢

### Curry Combs—

Fitch's.....50¢10¢@50¢10¢10¢  
Rubberper doz \$10.00.....20¢  
Perfect.....50¢

### Curtain Pins—

Silvered Glass.....net  
White Enamel.....net

### Cutlery—

Beaver Falls & Booth's.....38 1/2¢  
Wostenholme.....\$7.75 to 2

### Dampers, &c—

Dampers, Buffalo.....50¢  
Buffalo Damper Clips.....50¢  
Crown Damper.....40¢  
Excelsior.....40¢10¢

### Dividers—

See Compasses.

### Dog Collars—

Embossed, Gilt, Pope & Steven's list.....30¢10¢  
Leather, Pope & Steven's list.....40¢  
Brass, Pope & Steven's list.....40¢

### Door Springs—

Torrey's Rod, regular size.....\$ doz \$1.30  
Gray's, \$ gr, \$20.00.....20¢  
Bee Rod \$ gr, \$20.00.....20¢  
Warner's No. 1, \$ doz, \$2.50; No. 2, \$3.30.....40¢10¢@50¢  
Gem (Coll), list April 19, 1886.....10¢  
Star (Coll), list April 19, 1886.....20¢  
Victor (Coll).....60¢@60¢10¢  
Champion (Coll).....60¢10¢@60¢10¢10¢  
Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....\$  
Cowell's.....No. 1, \$ doz, \$18.00; No. 2, \$15.00.....50¢  
Rubber, complete, \$ doz, \$4.50.....55¢10¢  
Hercules.....50¢  
Shaw Door Check and Spring, 25¢@30¢35¢

### Drawing Knives—

Wetherby.....75¢5¢  
P. S. & W.....75¢5¢  
Mix.....75¢10¢  
New Haven.....75¢@75¢10¢  
Merrill.....60¢10¢@60¢10¢5¢  
Douglas.....75¢@75¢10¢  
Watrous.....15¢10¢@25¢  
L. & J. J. White.....20¢5¢  
Bradley's.....35¢  
Adjustable Handle.....25¢@35¢4¢  
Wilkinson's Folding.....25¢@25¢5¢

### Drills and Drill Stocks—

Blacksmiths'.....each \$1.75  
Blacksmiths' Self Feeding, each \$7.50, 20¢  
Breast, P. S. & W.....40¢10¢  
Breast, Wilson's.....30¢5¢  
Breast, Millers Falls.....each \$3.00, 25¢  
Breast, Bartholomew's.....each \$2.50, 25¢10¢@40¢  
Ratchet, Merrill's.....20¢@20¢5¢  
Ratchet, Ingersoll's.....20¢@20¢5¢  
Ratchet, Parker's.....20¢@20¢5¢  
Ratchet, Whitney's.....20¢10¢  
Ratchet, Weston's.....20¢@25¢  
Ratchet, Moore's Triple Action.....25¢@30¢  
Whitney's Hand Drill, Plain, \$11.00.....20¢10¢  
Adjustable, \$12.00.....20¢10¢  
Wilson's Drill Stocks.....10¢  
Automatic Boring Tools.....\$1.75@1.85

### Drill Bits—

Morse.....50¢10¢5¢  
Standard.....50¢10¢5¢  
Syracuse.....50¢10¢5¢  
Cleveland.....50¢10¢5¢  
Williams.....50¢10¢5¢  
New Process.....50¢10¢5¢

### Drill Bits—See Augers and Bits.

### Drill Chucks—See Chucks.

### Dripping Pans—

Small sizes.....\$ doz 6 1/4¢  
Large sizes.....\$ doz 6 1/4¢

### Egg Beaters.

Dover.....\$ doz \$1.50  
National, \$ doz \$4.50.....35¢4¢  
Family (T. & S. Mfg. Co.), \$ gro \$17.00.....\$18.00  
Duplex (Standard Co.).....\$ gro \$15.00  
Rival (Standard Co.).....\$ gro \$12.00  
Large Duplex (Standard Co.), \$ doz \$4.50  
Triumph (T. & S. Mfg. Co.), \$ gro \$10.50.....\$11.50

Advance, No. 1.....\$ gro \$10.50  
Advance, No. 2.....\$ gro \$10.00  
Bryan's.....\$ gro \$15.00  
Ayres' Spiral.....\$ gro \$5.00  
Double (H. & R. Mfg. Co.).....\$ gro \$16.20  
Easy (H. & R. Mfg. Co.).....\$ gro \$14.00  
Triple (H. & R. Mfg. Co.).....\$ gro \$16.20  
Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50  
Faine, Diehl & Co.'s.....\$ gro \$24.00

### Egg Poachers—

Buffalo Steam Egg Poachers, \$ doz, No. 1, \$6.00; No. 2, \$9.00.....25¢

### Electric Bell Sets—

Wollensaks.....20¢  
Bigelow & Dowse.....20¢

### Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F F F.  
Kegs, \$ doz 4 1/2¢ 5 1/2¢ 2 1/2¢  
1/4 kegs, \$ doz 4 1/4¢ 5 1/4¢ 2 1/4¢  
1/2 kegs, \$ doz 4 1/2¢ 5 1/2¢ 2 1/2¢  
1 lb cans, 10 6¢ 6 1/4¢ 5¢  
10 lbs cans, less than 10.....10¢ 10¢ 7 1/2¢

### Enameled and Tinned Ware—

See Hollow Ware.

### Escutcheon Pins—

Iron, list Nov. 11, 1885.....50¢10¢@50¢10¢5¢  
Brass.....60¢@60¢5¢

### Escutcheons.

Door Lock.....Same dis as Door Locks.  
Brass Thread.....60¢@60¢10¢  
Wood.....25¢

### Faucets—

Fenn's.....40¢  
Bohren's Pat. Rubber Ball.....25¢  
Fenn's Cork Stops.....35¢4¢  
Star.....60¢  
Frary's Pat. Petroleum.....40¢5¢2¢  
B. & L. B. Co.  
West's Lock, Open and Shut Key.....50¢  
Star, Metal Plug, new list.....40¢  
Lockport, Metal Plug, reduced list.....60¢  
Metallic Key, Leather Lined.....60¢10¢  
Cork Lined.....70¢5¢@70¢10¢  
Burnside's Red Cedar.....50¢  
Burnside's Red Cedar, bbl lots.....50¢10¢  
John Sommers.....40¢  
Peerless Best Block Tin Key.....40¢  
IXL, 1st quality, Cork Lined.....50¢  
Diamond Lock.....40¢  
Perfection, Fla. Red Cedar.....50¢  
Goodenough Cedar.....50¢  
Boss Metallic Key.....50¢  
Seable Cork Lined.....60¢  
Western Pattern Cork Lined.....50¢

Self-Measuring.....20¢10¢  
Enterprise, \$ doz \$50.00.....20¢10¢  
Lane's, \$ doz \$36.00.....25¢10¢  
Victor, \$ doz \$36.00.....25¢10¢

### Felloe Plates—

\$ doz 6¢@6 1/4¢

### Fifth Wheels—

Derby and Cincinnati.....45¢5¢

### Files—

Domestic—  
Nicholson Files, Rasps, &c.....60¢10¢@60¢  
Nicholson (X. F.) Files.....25¢  
Nicholson's Royal Files (Seconds).....75¢  
(extra prices on certain sizes)  
Other makers, best brands.....60¢10¢@60¢10¢10¢  
Fair brands.....60¢10¢@60¢10¢70¢  
Second quality.....70¢10¢@75¢10¢  
Nicholson's Horse Rasps.....60¢10¢@60¢  
Heiler's Horse Rasps.....60¢7 1/4¢@60¢10¢  
McCauley's Horse Rasps.....60¢10¢

### Files—Imported—

J. & Riley Carr.....list April 1, 1883, 15¢  
J. & Riley Carr Horse Rasps.....10¢  
Moss & Gamble.....list April 1, 1883, 15¢  
Butcher.....Butcher's list, 25¢30¢  
Stubs.....Stubs list, 25¢30¢  
Turton's.....Turton's list, 20¢25¢  
Greaves' Horse Rasps.....American list, 60¢

### Fluting Machines—

Knox, 1 1/4-inch Rolls.....\$3.25 each } 35¢  
Knox, 6-inch Rolls.....\$3.60 each } 35¢  
Eagle, 3 1/4-inch Roll, \$2.15.....35¢  
Eagle, 5 1/4-inch Roll, \$2.85.....35¢  
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....35¢  
Crown Jewel, 6 in.....\$3.50 each, 35¢  
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢  
Domestic Fluter.....each, \$1.50  
Geneva Hand Fluter, White Metal.....\$ doz \$12, 25¢  
Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00.....30¢  
Shepard Hand Fluter, No. 85 \$ doz \$15.30.....40¢  
Shepard Hand Fluter, No. 110 \$ doz \$11.00.....40¢  
Shepard Hand Fluter, No. 96 \$ doz \$11.00.....40¢  
Clark's Hand Fluter \$ doz \$15.00.....35¢  
Combined Fluter and Sad Iron.....\$ doz \$15.00.....30¢  
Buffalo.....\$ doz \$10.00.....10¢

### Fluting Scissors—

45¢

### Fodder Squeezers—

Blair's.....\$ doz \$2.00  
Blair's "Climax".....\$ doz \$1.25

### Forks—

Hay, Manure, &c., Asso. list.....65¢  
Hay, Manure, &c., Phila. list.....60¢@60¢5¢  
Plated, see Spoons.

### Freezers, Ice Cream—

Buffalo Champion.....60¢10¢5¢  
Shepard's Lightning.....65¢  
White Mountain.....60¢  
American.....0¢  
Gem.....65¢  
Blizzard.....70¢  
Double Action Crown.....60¢  
Crown.....60¢  
Star.....60¢

### Fruit and Jelly Presses—

Enterprise Mfg. Co.....20¢10¢@30¢  
Henis.....\$ doz \$3.75@4.00  
P. D. & Co.....\$ doz \$3.75@4.00  
Shepard's Queen City.....\$4.00

### Fry Pans—

High List.....75¢5¢@75¢10¢  
No.....0 1 2 3 4  
\$ doz \$3.75 \$4.70 \$5.30 \$5.95 \$6.55  
No.....5 6 7 8  
\$ doz \$7.50 \$8.75 \$10.00 \$11.25  
Low List.....65¢10¢  
No.....0 1 2 3 4  
\$ doz \$3.00 \$3.75 \$4.25 \$4.75 \$5.25  
No.....5 6 7 8  
\$ doz \$6.00 \$7.00 \$8.00 \$9.00

### Fuse—

Common Hemp Fuse, for dry ground, \$2.70  
Common Cotton Fuse, for dry ground 2.85  
Single Taped Fuse, for wet ground.....4.75  
Double Taped Fuse, for very wet gr.....8.00  
Triple Taped Fuse, for very wet gr.....7.25  
Small Gutta Percha Fuse, for water, 7.50  
Large Gutta Percha Fuse, for water, 12.00

### Gauges—

Marking, Mortise, &c.....60¢10¢  
Starrett's Surface, Center and Scratch.....25¢10¢  
Wire, low list.....10¢10¢  
Wire, Wheeler, Madden & Co.....10¢  
Wire, Morse's.....50¢50¢5¢  
Wire, Brown & Sharpe's.....10¢30¢

### Gimlets—

Nail and Spike.....50¢10¢5¢  
"Eureka" Gimlets.....40¢10¢  
"Diamond" Gimlets.....\$ gr \$5.00  
Double Cut, Shepardson's.....45¢@45¢5¢  
Double Cut, Ives.....60¢@60¢5¢  
Double Cut, Douglas'.....40¢10¢  
"Bee," \$ gr \$12.....25¢25¢5¢

### Glue—

Le Page's Liquid.....25¢25¢5¢  
Upton's Liquid.....35¢  
Le Page & Co.'s Improved Process.....25¢25¢5¢

### Glue Pots—

Tinned.....40¢  
Enamelled.....40¢5¢  
Family, Howe's "Eureka".....40¢  
Family, L. F. C.'s "Handy".....50¢

### Grindstones—

Small, at factory.....\$ ton \$7.50@9.00

### Grindstone Fixtures—

Sargent's Patent.....70¢10¢  
Reading Hardware Co.....30¢10¢

### Hack Saws—

See Saws.

### Halters—

Covert's, Rope, 1/2-in. Jute.....50¢2¢  
Covert's, Rope, 1/2-in. Hemp.....40¢2¢  
Covert's Adj. Rope Halters.....40¢2¢  
Covert's Hemp Horse and Cattle Tie.....50¢2¢  
Covert's Jute Horse and Cattle Tie.....60¢10¢2¢

### Hammers—

Handled Hammers—  
Maydole's, list Dec. 1, '85.....25¢25¢10¢  
Buffalo Hammer Co.....list Jan. 15, '87  
Humason & Beckley.....50¢@50¢10¢  
Atha Tool Co.....40¢10¢@50¢  
Fayette R. Plumb.....40¢10¢@50¢  
C. Hammond & Son.....40¢10¢@50¢  
Verree.....5¢  
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....30¢10¢  
Nelson Tool Works.....40¢10¢  
Warner & Noble.....20¢25¢  
Peck, Stow & Wilcox.....40¢  
Sargent's.....35¢@10¢

### Heavy Hammers and Sledges—

3 lb and under.....\$ doz 40¢ } 60¢10¢  
3 to 5 lb.....\$ doz 35¢ } 60¢10¢  
Over 5 lb.....\$ doz 30¢ } 60¢10¢  
Wilkinson's Smiths.....10¢4¢@11¢5¢

### Handcuffs and Leg Irons—

R. I. Tool Co., Handcuffs, \$15.00 \$ doz 10¢  
R. I. Tool Co., Leg Irons, \$35.00 \$ doz 10¢  
Tower's.....25¢  
Daley's Improved Handcuffs, 2 Hands, Polished, \$ doz \$48.00; Nickel, \$57.00; 3 Hands, Polished, \$ doz \$72.00; Nickel, \$84.00.....25¢

### Handles—



**Cross-Cut Saw Handles—**  
 Atkins' No. 1 Loop, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.  
 Boynton's Loop Saw Handles, 50¢... 60¢  
 Champion..... 50¢

**Hangers—**  
 Barn Door, old patterns..... 80¢10¢10¢70¢  
 Barn Door, New England, 80¢10¢10¢70¢  
 Samson Steel Anti-Friction..... 55¢  
 Orleans Steel..... 55¢  
 Hamilton Wrought Wood Track..... 55¢  
 U. S. Wood Track..... 55¢  
 Champion..... 60¢10¢  
 Rider and Wooster, Medina Wfg. Co.'s  
 List..... 70¢  
 Climax Anti-Friction..... 60¢  
 Climax Anti-Friction for Wood Track..... 55¢  
 Zenith for Wood Track..... 55¢  
 Reed's Steel Arm..... 50¢  
 Challenge, Barn Door..... 50¢  
 Sterling's Imp'v'd (Anti-Friction)..... 65¢10¢  
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00..... 60¢2¢  
 Cheritree..... 50¢10¢  
 Kiddier..... 50¢10¢60¢  
 The Boss..... 80¢10¢  
 Best Anti-Friction..... 60¢10¢  
 Duplex (Wood Track)..... 60¢10¢2¢  
 Terry's Pat., 7 doz pr. 4 in, \$10.00; 5 in, \$12.00..... 50¢5¢10¢10¢  
 Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00..... 50¢15¢60¢  
 Wood Track Iron Clad, 7 ft. 10¢..... 60¢  
 Carrier Steel Anti-Friction..... 50¢60¢10¢  
 Architect, 7 set \$6.00..... 20¢  
 Eclipse..... 20¢10¢  
 Felix, 7 set \$4.50..... 20¢  
 Richards'..... 30¢30¢10¢  
 Lane's Steel Anti-Friction..... 40¢10¢  
 Ball Bearing Door Hanger, 30¢10¢25¢10¢  
 Warner's Pat..... 40¢10¢  
 Stearns' Anti-Friction..... 40¢10¢10¢  
 Stearns' Challenge..... 25¢10¢25¢10¢10¢  
 Faultless..... 40¢40¢5¢  
 American, 7 set \$6.00..... 20¢10¢  
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢..... 40¢  
 Paragon, Nos. 1, 2 and 3..... 40¢10¢  
 Paragon, Nos. 5, 6, 7 and 8..... 40¢10¢  
 Crescent..... 60¢60¢10¢  
 Nickel, Cast Iron..... 50¢  
 Nickel, Malleable Iron and Steel..... 40¢  
 Scranton Anti-Friction Single Strap, 39¢4¢  
 Scranton Anti-Friction Double Strap, 40¢  
 Universal Anti-Friction..... 40¢  
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00..... 45¢  
 Star..... 40¢10¢40¢10¢5¢  
 May..... 50¢5¢50¢10¢  
 Barry, \$6.00..... 40¢10¢

**Harness Snaps—**  
 See Snaps.

**Hatchets—**  
 List Jan. 1, 1886..... 35¢40¢  
 Isaiah Blood..... 35¢40¢  
 Hunt's Shingling, Lath and Claw, 40¢5¢  
 Hunt's Broad..... 40¢  
 Buffalo Hammer Co..... 40¢10¢50¢  
 Hurd's..... 40¢10¢50¢  
 Fayette R. Plumb..... 40¢10¢50¢  
 Wm. Mann, Jr., & Co..... 50¢50¢5¢  
 Underhill Edge Tool Co..... 40¢5¢40¢10¢  
 Underhill's, Haines and Bright..... 35¢4¢  
 C. Hammond & Son..... 40¢10¢50¢  
 Simmons'..... 40¢10¢50¢  
 Peck's..... 40¢10¢40¢10¢5¢  
 Kelly's..... 50¢50¢5¢  
 Sargent & Co..... 50¢  
 Ten Eyck Edge Tool Co. 40¢10¢40¢10¢5¢  
 Collins..... 10¢

**Hay and Straw Knives—**  
 Lightning, Mfrs. price \$18.00, 25¢  
 But jobbers frequently give extras.  
 Gem..... 7 doz \$10  
 Wadsworth's..... 40¢7¢60¢10¢  
 Carter's Needle..... 40¢11¢60¢10¢  
 Heath's..... 7 doz \$13.50; 14 doz, 25¢  
 Auburn Hay, Com. and Spear Point..... 60¢  
 Auburn, Straw..... 40¢  
 Nollin's Hay..... 7 doz \$10.00

**Hinges—**  
**Wrought Iron Hinges**  
 Strap and T..... 75¢5¢75¢10¢  
 Screw Hook and..... 14 to 20 in, 7 D..... 34¢  
 Strap..... 22 to 36 in, 7 D..... 24¢  
 Heavy Welded..... 6 to 12 in, 7 D..... 34¢  
 Hook..... 14 to 20 in, 7 D..... 34¢  
 Hook..... 22 to 36 in, 7 D..... 24¢  
 Screw Hook..... 14 in, 7 doz \$1.50  
 and Eye..... 14 in, 7 doz \$2.45..... 10¢  
 Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢  
 Rolled Blind Hinges, Nos. 232 and 234..... 55¢10¢  
 Rolled Plate..... 70¢10¢  
 Rolled Raised..... 70¢10¢  
 Plate Hinges, 8, 10 & 12 in, 7 D..... 45¢  
 "Providence" over 12 in, 7 D..... 45¢

**Spring Hinges—**  
 Geer's Spring and Blank Butts..... 40¢  
 Union Spring Hinge Co.'s List, March, 1886..... 20¢  
 Acme and U. S..... 20¢  
 Empire and Crown..... 20¢  
 Hero and Monarch..... 20¢  
 American, Gem, and Star, Japanned, 20¢  
 American, Gem, and Star, Bronzed, net  
 Oxford, Bronze and Brass..... net  
 Barker's Double Acting..... 20¢10¢  
 Union Mfg. Co..... 25¢  
 Bommer's..... 15¢2¢  
 Buckman's..... 30¢  
 Chicago..... 30¢  
 Wiles..... 10¢  
 Devore's..... 40¢  
 Rex..... 40¢  
 Royal..... 40¢  
 Reliable..... 60¢  
 Champion..... 90¢

**Gate Hinges—**  
 Western..... 7 doz \$4.40, 60¢  
 N. E..... 7 doz \$7.00, 55¢  
 N. E. Reversible..... 7 doz \$5.20, 55¢10¢  
 Clark's, Nos. 1, 2, 3..... 60¢10¢5¢  
 N. Y. State..... 7 doz \$5.00, 55¢10¢  
 Automatic..... 7 doz \$12.50, 50¢  
 Common Sense..... 7 doz pair \$4.50, 50¢  
 Seymour's..... 45¢10¢  
 Shepard's..... 60¢10¢5¢  
 Reed's Latch and Hinges, 7 doz \$12.00, 50¢

**Blind Hinges—**  
 Parker..... 75¢2¢  
 Palmer..... 50¢5¢10¢  
 Seymour..... 70¢2¢  
 Nicholson..... 45¢10¢  
 Huffer..... 50¢

Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢5¢80¢  
 Clark's Morris Gravity..... 50¢  
 Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢75¢10¢5¢  
 Sargent's, No. 12..... 75¢10¢10¢  
 Reading's Gravity..... 75¢10¢75¢10¢5¢  
 Shephard's..... 75¢10¢5¢  
 Noiseless..... 80¢2¢4¢  
 Niagara..... 80¢5¢  
 Buffalo..... 80¢5¢  
 Clark's Genuine Pat..... 80¢5¢  
 O. S., Lull & Porter..... 75¢10¢  
 Acme, Lull & Porter..... 75¢5¢  
 Queen City Reversible..... 75¢  
 Clark's Lull & Porter, Nos. 0, 1, 14, 2, 2 1/2, 3..... 75¢10¢2¢4¢  
 North's Automatic Blind Pictures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50..... 25¢2¢

**Hoes—**  
**Handled—**  
 Garden, Mortar, &c..... 65¢  
 Planter's, Cotton, &c..... 65¢  
 Warren Hoe..... 60¢  
 Magic..... 7 doz \$4.00

**Eye—**  
 D. & H. Scovill..... 20¢  
 Lane's Crescent Planters Pattern, 45¢5¢  
 Lane's Razor Blade, Scovill Pattern..... 30¢  
 Maynard, S. & O. Pat..... 45¢5¢  
 Sandusky Tool Co., S. & O. Pat..... 60¢  
 Hubbard & Co., S. & O. Pat..... 60¢  
 Chattanooga Tool Co., S. & O. Pat..... 60¢  
 Grub..... 60¢60¢10¢

**Hog Rings and Ringers—**  
 Hill's Improved Ringers..... 7 doz \$4.50  
 Hill's Old Style Ringers..... 7 doz \$3.00  
 Hill's Tongue..... 7 doz \$4.50  
 Hill's Rings..... 7 doz bxs \$2.25; 2, 40  
 Perfect Rings..... 7 doz bxs \$1.75; 2, 40  
 Perfect Ringers..... 7 doz \$2.50  
 Blair's Hog Ringers..... 7 doz \$2.90; 2, 65  
 Blair's Hog Ringers..... 7 doz \$5¢; 10¢, 40¢  
 Champion Rings, Double..... 7 doz \$2.25  
 Brown's Ringers..... 7 doz \$2.00  
 Brown's Rings..... 7 doz \$1.25; 2, 30

**Hoisting Apparatus—**  
 Moore's Hand Hoist, with Lock Brake..... 20¢  
 Moore's Differential Pulley Block..... 40¢  
 Energy Mfg. Co's..... 25¢

**Holders, File and Tool—**  
 Balz Pat..... 7 doz \$4.00; 25¢  
 Nicholson File Holders..... 20¢

**Hollow-Ware—**  
**Iron—**  
 Stove Hollow-Ware—  
 Ground..... 60¢60¢5¢  
 Unground..... 60¢10¢60¢10¢10¢  
 Enameled Hollow-Ware—  
 Maslin Kettles..... 65¢10¢  
 Boilers and Saucepans..... 40¢5¢  
 Tinned Boilers and Saucepans..... 40¢  
 Gray Enameled-Ware—  
 Stove..... 50¢50¢5¢  
 Maslin Kettles..... 60¢10¢60¢10¢10¢  
 Boilers and Saucepans..... 40¢5¢  
 Agate and Granite Ware..... 25¢  
 Ruleless Hollow-Ware..... 50¢50¢5¢  
 Galvanized Tea-Kettles..... 50¢50¢5¢

**Inch—**  
 6 7 8 9  
 Each..... 55¢ 60¢ 65¢ 75¢

**Silver Plated—**  
 4 mo. or 5¢ cash in 30 days.  
 Reed & Barton..... 40¢2¢5¢  
 Maricott Britannia Co..... 40¢2¢5¢  
 Simpson, Hall, Miller & Co..... 40¢2¢5¢  
 Rogers & Brother..... 40¢2¢5¢  
 Hartford Silver Plate Co..... 40¢2¢5¢  
 William Rogers Mfg. Co..... 40¢2¢5¢

**Hooks—**  
**Cast Iron—**  
 Bird Cage, Sargent's List..... 60¢10¢10¢  
 Bird Cage, Reading..... 60¢10¢10¢  
 Clothes Line, Sargent's List..... 60¢10¢10¢  
 Clothes Line, Reading List..... 60¢10¢10¢10¢  
 Ceiling, Sargent's List..... 55¢10¢10¢  
 Harness, Reading list..... 55¢10¢5¢10¢10¢  
 Coat and Hat, Sargent's List..... 55¢10¢60¢10¢  
 Coat and Hat, Reading..... 50¢10¢50¢10¢10¢

**Wrought Iron—**  
 Cotton..... 7 doz \$1.25  
 Cotton Pat. (N.Y. Mallet & Handle Wks.)..... 30¢  
 Tassel and Picture (T. & S. Mfg. Co.)..... 50¢  
 Wrought Staples, Hooks, &c..... See Wrought Goods.

**Wire—**  
 Wire Coat and Hat, Gem, list April, 1886..... 45¢  
 Wire Coat and Hat, Miles, list April, 1886..... 45¢  
 Indestructible Coat and Hat..... 45¢  
 Wire Coat and Hat, Standard..... 45¢  
 Belt..... 75¢10¢80¢

**Miscellaneous**  
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50  
 Nollin's Grass..... 7 doz \$2.25  
 Bush..... 65¢90¢  
 Whiffletree—Patent..... 55¢  
 Hooks and Eyes—Malleable Iron..... 70¢70¢10¢  
 Hooks and Eyes—Brass..... 60¢10¢10¢  
 Fish Hooks, American..... 50¢  
 Bench Hooks..... See Bench Stops.

**Horse Nails—**  
 Nos. 6 7 8 9 10  
 Ausable..... 28¢ 28¢ 25¢ 24¢ 23¢  
 Clinton, Fin..... 24¢ 22¢ 21¢ 20¢ 19¢  
 Essex..... 28¢ 26¢ 25¢ 24¢ 23¢  
 Lyra..... 25¢ 23¢ 22¢ 21¢ 20¢  
 Snowden..... 25¢ 23¢ 22¢ 21¢ 20¢  
 Putnam..... 23¢ 21¢ 20¢ 19¢ 18¢  
 Vulcan..... 23¢ 21¢ 20¢ 19¢ 18¢ in year 185  
 Northwest'n..... 25¢ 23¢ 22¢ 21¢ 20¢  
 Globe..... 23¢ 21¢ 20¢ 19¢ 18¢ 20¢24¢  
 Boston..... 23¢ 21¢ 20¢ 19¢ 18¢ 20¢24¢  
 A. C..... 25¢ 23¢ 22¢ 21¢ 20¢  
 C. B.-K..... 25¢ 23¢ 22¢ 21¢ 20¢  
 Champlain..... 28¢ 26¢ 25¢ 24¢ 23¢ 25¢10¢10¢

New Haven..... 28¢ 26¢ 25¢ 24¢ 23¢  
 Saranac..... 23¢ 21¢ 20¢ 19¢ 18¢ 30¢10¢  
 Champion..... 25¢ 23¢ 22¢ 21¢ 20¢ 30¢10¢  
 Capewell..... 28¢ 26¢ 25¢ 24¢ 23¢ 35¢5¢35¢10¢  
 Star..... 23¢ 21¢ 20¢ 19¢ 18¢ 10¢10¢10¢12¢4¢  
 Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢ 35¢  
 Western..... 23¢ 21¢ 20¢ 19¢ 18¢ 40¢10¢  
 Empire Bronzed..... 14¢ 1¢ D.  
**Horse Shoes—See Shoes Horse.**

**Hose, Rubber—**  
 Competition..... 75¢10¢75¢10¢5¢  
 Standard..... 70¢70¢10¢  
 Extra..... 60¢60¢10¢  
 N. Y. B. & P. Co., Para..... 30¢10¢  
 N. Y. B. & P. Co., Extra..... 50¢  
 N. Y. B. & P. Co., Dundee..... 60¢10¢5¢

**Huskers—**  
 Blair's Adjustable..... 7 gr \$8.00  
 Blair's Adjustable Clipper..... 7 gr 7.00

**Indurated Fiber-Ware.**  
 Splittone, No. 2, 7 doz..... \$6.75  
 Basins, Ringed, 7 doz, No. 1, \$3.70; No. 2, \$3.10; No. 3..... \$2.70  
 Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 7 doz, nests..... \$16.87  
 Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 7 doz, nests..... \$8.37  
 Butter Bowls, 15, 17 and 19-inch (3 pieces), 7 doz, nests..... \$6.75  
 Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) 7 set..... \$3.00  
 Dry Measures, 1, 2, 4, 8 and 16 lbs. (6 pieces), 7 set..... \$2.25  
 See Also *Fills*.

**Jack Screws—See Screws.**

**Kettles—**  
 Spun, Stamped.  
 Brass, 7 to 17 in., 7 doz..... 24¢ 21¢  
 Brass larger than 17 in., 26¢ 23¢  
 Enameled and Tea Kettles..... See Hollow-Ware.

**Keys—**  
 Lock Ass'n list Dec. 30, 1886..... 50¢10¢  
 Eagle, Cabinet, &c..... 60¢5¢  
 Hotchkiss' Brass Blanks..... 40¢  
 Hotchkiss, Copper and Tinned..... 40¢  
 Hotchkiss' Pad and Cab..... 40¢  
 Ratchet Bed Keys..... 7 doz \$4.00, 15¢  
 Wollensak Tinned..... 60¢10¢

**Knife Sharpeners—**  
 Parkin's..... Appledow Handles..... 7 doz \$5.00, 40¢  
 Rosewood or Cocobolo..... 7 doz \$9.00, 40¢

**Knives—**  
 Wilson's Butcher Knives..... 25¢30¢  
 Ames' Butcher Knives..... 25¢  
 Porter's Butcher Knives..... 40¢  
 Nichols' Butcher Knives..... 40¢10¢  
 Ames' Shoe Knives..... 20¢25¢  
 Ames' Bread Knives, 7 doz \$1.50, 15¢20¢  
 Moran's Shoe and Bread..... 20¢  
 Hay and Straw..... See Hay Knives.  
 Table and Pocket..... See Cutlery.  
 Corn, Auburn Mfg. Co. Western Pat..... \$2.00  
 Corn, Auburn Mfg. Co. Crescent..... \$3.50

**Knobs—**  
 Door Mineral..... 65¢68¢  
 Door Por. Jap'd..... 75¢78¢  
 Door Por. Nickel..... \$2.00; 2, 25¢  
 Door Por. Plated Nickel..... \$2.00; 2, 25¢  
 Drawer, Porcelain..... 60¢10¢60¢10¢10¢  
 Hemacite Door Knobs..... 40¢10¢10¢  
 Yale & Towne Wood, list Dec., 1886..... 40¢  
 Furniture Plain..... 75¢ gro 10¢, 10¢  
 Furniture Wood Screws..... 25¢10¢  
 Base, Rubber Tip..... 70¢10¢5¢  
 Picture, Jap'd..... 60¢10¢60¢70¢  
 Picture, Sargent's..... 70¢10¢  
 Picture, Hemacite..... 35¢5¢  
 Shutter, Porcelain..... 65¢10¢  
 Carriage, Jap..... 7 gro 80¢, 60¢10¢

**Ladles—**  
 Melting, Reading..... 55¢10¢  
 Melting, Sargent's..... 35¢10¢  
 Melting, Monroe's Pat..... 7 doz \$4.00, 40¢  
 Melting, P. S. & W..... 35¢10¢40¢  
 Melting, Warner's..... 30¢

**Lawn Mowers—**  
 Standard List..... 50¢10¢  
 Quaker City..... 60¢10¢  
 Enterprise..... 60¢10¢

**Lanterns—**  
**Tubular—**  
 Plain with Guards, 7 doz..... \$4.00; 4, 25¢  
 Lift Wire, with Guards..... \$4.50; 4, 75¢  
 Square Plain, with Guards..... \$4.00; 4, 25¢  
 Sq. Lift Wire, with Guards..... \$4.25; 4, 50¢  
 Without Guards, 25¢ 7 doz less.

**Miscellaneous**  
 Police Small, \$6.00; Medium, \$7.25; Large, \$9.75..... 20¢25¢

**Lemon Squeezers—**  
 Porcelain Lined, No. 1..... 7 doz \$6.00, 25¢30¢  
 Wood, No. 2..... 7 doz \$3.00, 35¢  
 Wood, Common..... 7 doz \$1.70; 1, 75¢  
 Dymally's Improved..... 7 doz \$3.12, 20¢  
 Sammis..... No. 1, \$5.00; No. 2, \$6.12, \$18 7 doz..... 25¢10¢  
 Jennings' Star..... 7 doz \$2.50  
 The Boss..... 7 doz \$2.50  
 Dean's, Nos. 1, 7 doz \$6.50; 2, \$3.35; 3, \$1.90  
 Little Giant..... 50¢50¢5¢  
 King..... 40¢2¢5¢

**Lines—**  
 Cotton and Linen Fish, Draper's..... 50¢  
 Draper's Chalk..... 60¢  
 Draper's Masons' Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25..... 25¢  
 Cotton Chalk..... 50¢  
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; No. 5, \$3..... 10¢  
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 7 gro..... 25¢  
 Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50..... 40¢  
 Mason's Colored Cotton..... 18 10 20  
 Wire Clothes..... Nos. 18 10 20 \$3.60 \$3.00 \$2.50

Ventilator Cord, Samson Braided, White or Drab Cotton, 7 doz \$7.50, 20¢

**Locks, &c.—**  
**Door Locks, Latches, &c.**  
 List Dec. 30, '86, chgd Feb. 2, '87..... 50¢10¢60¢5¢  
 Mallory, Wheeler & Co., list July, '88..... 50¢10¢60¢  
 Sargent & Co., list Aug. 1, '85..... 55¢2¢  
 Reading Hardware Co., list Feb. 2, '88..... 55¢60¢10¢  
 Livingston & Co..... 70¢  
 Note—Lower net prices often made.  
 Perkins' Burglar Proof..... 50¢25¢  
 Yale..... 35¢  
 F. Many's "Extension Cylinder" \$10.50 7 doz..... 35¢  
 Barnes Mfg. Co..... 40¢40¢10¢  
 Yale..... net prices  
 Deitz Flat Key..... 30¢  
 L. & C. Round Key Latches..... 30¢10¢  
 L. & C. Flat Key Latches..... 35¢10¢  
 Shepherd's Night Latches..... 15¢  
 Felter or American..... 40¢10¢  
 Seed's N. Y. Hasp Lock..... 25¢

**Cabinet—**  
 Eagle, Gaylord Par- } list March, '84, rev. }  
 ker and Corbin..... } Jan. 1, '85, 35¢2¢  
 Deitz, Nos. 36 to 39..... 40¢  
 Deitz, Nos. 51 to 53..... 40¢10¢  
 Deitz, Nos. 56 to 58..... 30¢  
 Stoddard Lock Co..... 30¢35¢4¢  
 "Champion" Night Latches..... 40¢  
 Barnes Mfg. Co..... 40¢40¢10¢  
 Eagle and Corbin Trunk..... 25¢2¢  
 "Champion" Cab. and Combin..... 35¢4¢  
 Yale..... net prices  
 Romer's..... 25¢

**Padlocks—**  
 List Dec. 23, '84..... 75¢75¢10¢  
 Yale Lock Mfg. Co.'s..... net prices  
 Eagle..... 30¢  
 Eureka, Eagle Lock Co..... 40¢2¢  
 Romer's, Nos. 0 to 91..... 30¢  
 Romer's Scandinavian, &c., Nos. 100 to 500..... 15¢  
 A. E. Deitz..... 40¢  
 Champion Padlocks..... 40¢  
 Hotchkiss..... 30¢  
 Star..... 45¢  
 Horseshoe..... 7 doz \$6. 40¢40¢10¢  
 Barnes Mfg. Co..... 40¢40¢10¢  
 Nock's..... 30¢  
 Brown's Pat..... 25¢  
 Scandinavian..... 60¢60¢10¢  
 Frahm's Pat. Scandinavian low list..... 60¢  
 Ames Sword Co. up to No. 150..... 40¢  
 Ames Sword Co. above No. 150..... 50¢

**Lumber Tools.**  
 Ring Peavies, "Blue Line"..... 7 doz \$20.00  
 Ring Peavies, Common..... 7 doz \$18.00  
 Steel Socket Peavies..... 7 doz \$21.00  
 Mail Iron Socket Peavies..... 7 doz \$19.00  
 Cant Hooks, "Blue Line"..... 7 doz \$16.00  
 Cant Hooks, Common Finish..... 7 doz \$14.00  
 Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish..... \$16.00  
 Cant Hooks, Mail. Socket Clasp, Common Finish..... \$14.50  
 Cant Hooks, Clip Clasp, "Blue Line" Finish..... 7 doz \$14.00  
 Cant Hooks, Clip Clasp, Common Finish..... 7 doz \$12.00  
 Hand Spikes..... 7 doz 6 ft., \$15.00; 8 ft., \$20.00  
 Pike Poles, Pike & Hook, 7 doz, 15 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50  
 Pike Poles, Pike only, 7 doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$12.00; 18 ft., \$13.00; 20 ft., \$14.00  
 Pike Poles, not ironed, 7 doz, 12 ft., \$9.00; 14 ft., \$10.00; 16 ft., \$11.00; 18 ft., \$12.00; 20 ft., \$13.00  
 Setting Poles, 7 doz, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00  
 Swamp Hooks..... 7 doz \$18.00

**Lustro—**  
 Four-ounce Bottles..... 7 doz, \$1.75; 7 doz gross..... \$17.00

**Mallets—**  
 Hickory..... 20¢10¢20¢10¢10¢  
 Lignumvite..... 20¢10¢20¢10¢10¢  
 B. & L. Block Co., Hickory & L. V..... 30¢30¢10¢

**Match Safes—**  
 Dangerfield's Self-Igniting..... 7 doz \$1.50.

**Mattocks, Regular list..... 60¢5¢60¢10¢**

**Meat Cutters—**  
 Dixon's 7 doz..... 40¢5¢  
 Nos..... 2 3 4  
 \$14.00 \$17.00 \$19.00 \$30.00  
 Woodruff's 7 doz..... 40¢5¢  
 Nos..... 100 150  
 \$15.00 \$18.00

Champion 7 doz..... 40¢45¢  
 Nos..... 200 300 400  
 \$22.00 \$27.00 \$40.00  
 Hales Pattern 7 doz..... 70¢70¢5¢  
 Nos..... 11 12 13  
 \$27.00 \$33.00 \$45.00  
 American..... 30¢  
 Nos..... 1 2 3 4 B 5  
 Each..... \$5 \$7 \$10 \$25 \$60 \$80  
 Enterprise..... 30¢  
 Nos..... 10 12 22 32 42  
 Each..... \$3 \$2.50 \$4 \$6 \$15  
 Pennsylvania..... 40¢10¢  
 Nos..... 1 2 3 00  
 7 doz..... \$24.00 \$28.00 \$36.00 \$28.00  
 Miles' Challenge 7 doz..... 45¢45¢10¢  
 Nos..... 1 2  
 \$22.00 \$30.00 \$40.00  
 Home No. 1..... 7 doz, \$26.00, 55¢10¢  
 Draw Cut, each..... 50¢  
 Nos..... 5 6 8  
 \$60 \$75 \$80 \$225..... 20¢25¢  
 Beef Shavers (Enterprise)..... 20¢10¢30¢  
 Chadborn's Smoked Beef Cutter..... 7 doz \$6.00

**Mincing Knives—**  
 Am. 2d quality, 7 gr., 1 blade, \$7; 2 blades, \$12; 3 blades, \$18..... net  
 Lothrop's..... 20¢10¢  
 Smith's, 7 doz, Single, \$2.00; Double, \$3 40¢45¢  
 Knapp & Cowles..... 50¢10¢60¢  
 Buffalo Adjustable..... 7 doz, \$3.00, 25¢

**Atkins' Silver Steel Diamond X Cuts**

Atkins' Special Steel Dexter X	Cuts	foot 70¢
		foot 50¢
Atkins' Special Steel Diamond X	Cuts	foot 30¢
Atkins' Champion and Electric Tooth	X Cuts	foot 27¢23¢
Atkins' Hollow Back X Cuts		foot 18¢
Atkins' Mulay, Mill and Drag		40¢
W. M. & C. Hand		30¢5¢30¢10¢
W. M. & C. Champion X Cuts		regular
		foot 24¢22¢
W. M. & C. X Cuts, Thin Back		foot 27¢25¢
Peace Circular and Mill		45¢10¢
Peace Circular and Mill		

Peace Cross Cuts, Standard

Peace Cross Cuts, Thin Back  $\frac{3}{4}$  foot 27@28¢  
 Richardson's Circular and Mill 45@45¢10¢  
 Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢  
*Hack Saws—*  
 Griffin's, complete. .... 40¢10@50¢  
 Griffin's Hack Saw, Blades. .... 40¢10@50¢  
 Star Hack Saws and Blades. .... 25¢

**Diamond Hack Saws and B  
Eureka and Crescent.....**

**Saw Frames—**  
White Vermont..... $\frac{1}{2}$  gro \$9.00@10.00  
Red, Polished and Varnished..... $\frac{1}{2}$  doz  
\$1.50, 25%  
**Saw Sets—**  
Stillman's Genuine... $\frac{1}{2}$  doz \$5.00@7.75,  
40%  
Stillman's Imita.....3 doz \$3.25@5.25

Common

COMMERCIAL Lever... Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 84

**Bemis &  
Hamme**

Bemis & Call Co.'s Plate.....	10c
Bemis & Call Co.'s Cross Cut.....	12 1/2c
Alken's Genuine.....	\$13.00, 50c-10c
Alken's Imitation.....	\$7.00, 55c-5c
Hart's Pat. Lever.....	20c
Diaston's Star, #0, No. 16, \$5.50; 20c	10c-20c, 10c-10c
Atkin's Lever, # dos No. 1, \$6.00; No. 2,	\$3.00
Atkin's Criterion.....	# dos \$7.50
Croissant (Keller), No. 1, \$15.00; No. 2,	\$24.00.....
Avery's Saw Set and Punch.....	40c-10c
Am. Tool Co.'s Superior.....	# dos \$15, 50c

**Saw Tools—**

Atkin's Perfection, \$15.00; Excelsior, \$6.00 per doz.

**Scales -**

Hatch, Counter, No. 171, good quality, \$21.00 per doz.

Hatch, Tea, No. 161.... \$4.75 per doz.

Union Platform, Plain..... \$2.10 @ 2 doz.

Union Platform, Striped..... \$2.20 @ 2 doz.

Chattillon's Grocers' Trip Scales..... 50¢

Chattillon's Eureka..... 25¢

Chattillon's Favorite..... 40¢

Family, Turnbulla..... \$6.50 & 10¢

Riehle Bros.' Platform..... \$1.00

### Don't Be a

**Scale Beams—**

Scale Beams, List Jan. 12, '82... 50&100  
50&10&25  
Chatillon's No. 1..... 40%  
Chatillon's No. 2..... 50%

**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.)  
\$6.50..... 80&100

Box, 1 Handle.....	79
Box, 2 Handle.....	79

Defence Box and Ship.....	20¢10
Foot.....	50¢10@60
Ship, Common.....	7 doz \$3.50 net
Ship, R. I. Tool Co.....	10¢

**Screen Window and Door Frames—**

**Porter's Pat. Window and Door Frame.**

Thompson Screen Co., Inc.	\$34.210
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**Warner's**

**Screw Drivers—**

Douglas Mfg. Co.....	20¢	10¢	10¢
Disston's.....	45¢	10¢	
Disston's Pat. Excelsior.....	45¢	10¢	
Buck Bros.....	45¢	10¢	
Stanley R. & L. Co.'s.....	30¢		

**Varnished Handles.....**  
**Black Handles. ....**

Sargent & Co.'s	
No. 1 Forged Blade.....	80¢10¢10¢
Nos. 20, 30 and 60.....	65¢11¢10¢
Knapp & Cowles' No. 1.....	60¢20¢70¢
No. 1 Extra.....	80¢60¢10¢
Nos. 00 & 4.....	50¢5¢50¢10¢5¢
Stearns'	25¢10¢5¢
Gay & Parsons.....	35¢
Champion.....	25¢10¢
Clark's Pat.....	80¢33¢4¢
Clark's Adjustable.....	50¢

**Ellrich's Socket and Ratch  
Allard's Spiral, new list...**

Kolb's Common Sense 7 doz \$6.00, 25 & 10 doz \$10.00  
Syracuse Screw-Driver Bits..... 30 & 30 & 5 doz \$10.00  
Screw Driver Bits..... 7 doz 50 & 75 doz \$10.00  
Screw-Driver Bits, Parr's..... 7 doz \$6.25  
Fray's Hol. Hdle. Sets.No. 3, \$12.00.

**P. D. & Co.'s all Steel.....**

**Screws—**  
**Wood Screws—List March 1, 1880**  
 Flat Head Iron.....50¢  
 Round Head Iron.....35¢  
 Flat Head Brass.....45¢  
 Round Head Brass.....35¢  
 Flat Head Bronze.....45¢  
 Round Head Bronze.....35¢

**Extras**  
 often given  
 by jobbers

<b>Machine.</b> Flat Head, Iron.....55¢ Round Head, Iron.....50¢	<b>Soldering Irons.</b> Covert's Adjustable, list Jan. 1, 1888.....35¢25	<b>Common and Patent Brads, 70&amp;10&amp;70&amp;</b> Hungarian Nails.....70&10&70&10&10& Chair Nails.....70&10&70&10&10& Zinc Glaziers' Points.....50¢60&25¢ Cigar Box Nails.....50&10&50&10&25¢ Picture Frame Points.....50&10&50&10&25¢ Looking Glass Tacks.....50&10&50&10&25¢ Leathered Carpet.....50&10&50&10&25¢ Brush Tacks.....50&10&50&10&25¢ Shoe Finders, list Jan. 2, 1888, 10&10&10&	<b>Parker's.....20¢25¢</b> Wilson's.....55¢ Howard's.....40¢ Bonney's.....40&10&10& Miller's Falls.....40&10&10& Trenton.....40&5&40&10& Merrill's.....15¢20¢ Sargent's.....60&10&10& Backus and Union.....40¢ Double Screw Leg.....15¢10¢ Prentiss's.....20&5&25¢ Simpson's Adjustable.....40¢ Moore's.....20¢
<b>Bench and Hand.</b> Bench, Iron.....55&10&55&10&10& Bench, Wood.....50¢ Bench, Wood, Hickory.....50¢ Hand, Wood.....25&10&25&10&25¢ Lag, Blunt Point.....75¢ Coach and Lag, Gimlet Point.....75¢ Bed.....25¢50¢ Hand Rail, Sargent's.....60¢ Hand Rail, H. & B. Mfg. Co.....70&10&70& Hand Rail, Am. Screw Co.....75¢ Jack Screws, Miller's Falls list.....50&50&25¢ Jack Screws, P. S. & W.....35¢ Jack Screws, Sargent.....60&10&60&10&25¢ Jack Screws, Stearns.....40¢40&10¢	<b>Spoke Shaves.</b> Iron.....45¢ Wood.....30¢ Bailey's (Stanley R. & L. Co.).....40&10¢ Stearns.....30&10&30¢	<b>Wire Carpet Nails.....35¢</b> <b>Wire Brads &amp; Nails, see Nails, Wire.</b> <b>Steel-Wire Brads, R. &amp; E. Mfg. Co.'s list.....50&amp;10¢</b>	<b>Saw Filers.</b> Bonney's, Nos. 2 & 3, \$15.00.....40&10¢ Stearns.....35¢4&10¢33&4&10&10¢ Stearns's Silent Saw Vises.....35¢4&35¢ Sargent's.....60¢4&10¢ Hopkins.....50¢ Reading.....50¢ Wentworth.....30¢10¢ Combination Hand Vises.....5¢ gr \$4&10¢ Cowell Hand Vises.....30¢ Bauer's Pipe Vises.....10¢
<b>Scroll Saws.</b> Lester, complete, \$10.00.....25¢ Rogers, complete, \$4.00.....35¢ Barnes' Builders' and Cabinet Makers' \$15.....25¢ Barnes' Scroll Saw Blades.....35¢	<b>Spoons and Forks.</b> <b>Tinned Iron.</b> Basting, Cen. Stamp. Co.'s list.....70&10¢ Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10¢ Buffalo S. S. & Co.....35¢4&35¢ Silver-Plated—(4 mos. or 5¢ cash 30 days) Meriden Brit. Co., Rogers.....50¢ C. Rogers & Bros.....50¢ Rogers & Bro.....50¢ Reed & Barton.....50¢ Wm. Rogers Mfg. Co.....50&10¢90¢ Simpson, Hall, Miller & Co.....50&10¢ Holmes & Edwards Silver Co.....50&10¢ L. Boardman & Son.....50&10¢	<b>Tap Borers.</b> Common and Rind.....20&10¢ Ive's Tap Borers.....35¢4&35¢ Enterprise Mfg. Co.....20&10¢30¢ Clark's.....35¢4&35¢	<b>Wagon Boxes.</b> Per D.....2½¢
<b>Scythe Snaths.....50&amp;25¢</b> <b>Shears.</b> American (Cast) Iron.....75&10&75&10&25¢ Pruning. See Pruning Hooks and Shears Bernard's Lamp Trimmers.....50¢ Tinner's.....30&25¢ Seymour's, list, Dec. 1881.....60&10&10&60&10&10&5¢ Heinrich's, list, Dec. 1881.....60&10&10&60&10&10&5¢ Heinrich's Tailor's Shears.....35¢4& First quality C. S. Trimmers.....80¢40&10¢ Second quality C. S. Trimmers.....80&10&80&10&10¢ Acme Cast Shears.....10&10¢ Diamond Cast Shears.....10¢ Clipper.....10&10¢ Victor Cast Shears.....75&10&75&10&25¢ Howe Bros. & Hulbert, Solid Forged Steel.....40¢ Chicago Drop Forge & F. Co., Solid Steel Forged.....60¢ Clausen Shear Co., Japanned.....70¢ Clausen Shear Co., Nickel, same list.....60¢	<b>Miscellaneous.</b> Holmes & Edwards Silver Co.: No. 67 Mexican Silver.....50&10¢ No. 30 Silver Metal.....50&10¢ No. 24 German Silver.....50&10¢ No. 50 Nickel Silver.....50¢ No. 49 Nickel Silver.....50&10¢ German Silver.....50¢50&25¢ German Silver, Hall & Elton.....50&25¢ cash Nickel Silver.....50&25¢50&10&25¢ cash Britannia.....60¢ Boardman's Nickel Silver.....50¢ Boardman's Britannia Spoons, case lots.....60¢	<b>Thermometers.</b> Tin Case.....50¢30&10¢	<b>Wagon Jacks.</b> Daisy.....5¢ dos \$4.00, 25¢
<b>Sheaves.</b> <b>Sliding Door.</b> M. W. Co. list July, 1888.....50&10&60&25¢ R. & E. list Dec. 18, 1888.....55&20¢ Corbin's list.....60&10&25¢ Patent Roller.....60&10&25¢ Patent Roller, Hatfield's.....75¢ Russell's Anti-Friction, list Dec. 1888.....60&25¢ Moore's Anti-Friction.....50¢	<b>Springs.</b> Elliptic, Concord, Platform and Half Scroll.....60¢60&25¢ Cliff's Bolster Springs.....25¢	<b>Ties, Bale-Steel</b> Standard Wire, list.....50&10&25¢	<b>Washer Cutters.</b> Smith's Pat.....5¢ dos \$12.00, 20&10&10¢ Johnson's.....5¢ dos \$11.00, 35¢4& Penny's.....5¢ dos \$11.00, 55¢ Appleton's.....5¢ dos \$15.00, 30&10¢ Bonney's.....30&10¢
<b>Sliding Shutters.</b> R. & E. list Dec. 18, 1888.....60&10&25¢ Sargent's list.....60&10¢ Reading list.....60&10&10¢	<b>Squares.</b> Steel and Iron.....75&10&80¢ Nickel-Plated.....60&10&10&70¢ Try Square and T Bevels.....60&10&10&70¢ Dixon's Try Square and T Bevels.....50¢ Winterbottom's Try and Miter.....50&10¢ Starrett's Micrometer Caliper Squares.....25¢ Avery's Flush Bevel Squares.....30&25¢	<b>Timble Skeins—See Skeins.</b>	<b>Washers.</b> Size.....5-16 3/4 1/2 3/4 1 1 1/2 Washers.....5/16 3/8 1/2 3/4 1 1 1/2 In lots less than 300 D, 5¢, add 1/4¢, 5-D boxes 1¢ to list.
<b>Ship Tools.</b> L. & I. J. White.....30&25¢ Albertson Mfg. Co.....25¢	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Tinware.</b> Stamped, Japanned and Plated, list Jan. 20 1887.....75¢75&25¢	<b>Wedges.</b> Iron.....5¢ D 3/4¢ Steel.....5¢ D 4¢
<b>Shoes, Horse, Mule, &amp;c.—</b> <b>Horse.</b> Burden's, Perkins', Phoenix, at factory.....\$4.00	<b>Stocks and Dies.</b> Blacksmith's Waterford Goods.....30&25¢30&10¢ Butterfield's Goods.....30&25¢30&10¢ Lightning Screw Plates.....25¢30¢ Reece's New Screw Plates.....35¢4&5¢40¢	<b>Tire Benders, Upsetters, &amp;c.—</b> Stoddard's Lightning Tire Upsetters.....15¢ Detroit Perfected Tire Bender.....15¢	<b>Well Buckets, Galvanized.</b> Hill's.....5¢ dos, 12 qt, \$4.25; 14 qt, \$5.25 Iron Clad.....5¢ dos, 14 qt, \$4.25; \$4.50 Whiting's Flat Iron Band.....\$4.25; \$4.50 Whiting's Wired Top.....5¢ dos \$4.00, \$4.25
<b>Mule.</b> Add 1¢ per keg to above prices.	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Tobacco Cutters.</b> Champion.....30&10&30¢ Wood Bottom.....5¢ dos \$5.00; \$5.25 All Iron.....5¢ dos \$4.25 Nashua Lock Co's 5¢ dos, \$18.00 50¢55¢ Wilson's.....55¢ Sargent's.....5¢ dos, \$24, 55&10¢ Acme.....5¢ dos, \$20.00, 40¢	<b>Well Wheels.</b> 8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25
<b>Ox, Wrought.</b> Ton lots.....5¢ D 9¢ 1000 D lots.....5¢ D 9¢ 500 D lots.....5¢ D 10¢	<b>Steel Yards.....40&amp;10&amp;50¢</b>	<b>Transom Lifters.</b> Wellenak's: Class 3 and 4, Bronzed Iron.....50¢ Class 3 and 4, Bronze Metal.....25¢ Class 3 and 4, Brass.....35¢ Sight Lifters.....35¢ Crown, Eagle and Shield.....50¢ Reihen, list Jan. 1, 1887.....50&10&2¢ Bronzed Iron Rods.....50&10&2¢ Brass, Real Bronze or Nickel Plate.....30¢ Excelsior.....50&10&2¢ Shaw's.....50&10¢ Payson's Universal.....40¢40&10¢	<b>Wire.</b> <b>Iron.</b> Market.....40¢ Br. & Ann., Nos. 0 to 18.....70&10&75¢ Cop'd, Nos. 0 to 18.....70¢70&25¢ Galv., Nos. 0 to 18.....55&25¢ Tin'd, Tinned list Nos. 0 to 18.....67¢4¢ Br. and Ann'd, Nos. 16 to 18, 75¢4¢ Bright and Ann'd, Nos. 19 to 26, 75¢ Br. and Ann'd, Nos. 27 to 36, 75¢10&25¢ Tinned.....70¢70&10¢ Tinned Broom Wire.....70&5¢70&10¢ Galvanized Fence.....55¢ Annealed Fence, Nos. 8 and 9.....75¢ Annealed Grape, Nos. 10 to 14.....15¢20¢ Brass, list Jan. 18, 1884.....15¢20¢ Copper, list Jan. 18, 1884.....25¢ Barb Fence.....See Trade Report Wire on Spools.....55¢ Main's Steel and Tin'd Wire on Spools.....40¢ Main's Brass and Cop. Wire on Spools 30¢ Cast Steel Wire.....50¢ Stub's Steel Wire.....50¢00 to 2, 30¢ Steel Music Wire, Nos. 12 to 30, 55¢ 5¢ Picture Wire.....New list, 50¢ Barb Wire Safety Guards.....1000, \$9.00, 25¢ Wire Clothes Lines, see Lines.
<b>Shovel and Spades.</b> Ames' Shovels, Spades, &c., list Nov. 1, 1888.....30¢ NOTE.—Jobbers frequently give 5¢ to 7½¢ extra on above.	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Traps.</b> <b>Game.</b> Newhouse.....35¢40&25¢ Onida Pattern.....70¢70&25¢ Game, Blake's Patent.....40&10&25¢ <b>Mouse and Rat.</b> Mouse Wood Choker, 5¢ dos holes, 11¢12¢ Mouse, Round Wire.....5¢ dos \$1.50, 10¢ Mouse, Cage Wire.....5¢ dos \$2.50, 10¢ Mouse, Catch-em-alive.....5¢ dos \$2.50, 15¢ Mouse, "Bonanza".....5¢ gr \$10.00 net Mouse Delusion.....5¢ gr \$10.00, 10¢ Rat "Decoy".....5¢ gr \$10.00, 10¢ Ideal.....5¢ gr \$10.00 Cyclone.....5¢ gr \$5.25 Hotchkiss Metallic Mouse, 5-hole traps.....5¢ dos 90¢ In full cases.....5¢ dos 75¢	<b>Wire Cloth, Netting, &amp;c.</b> Painted Screen Cloth, good quality.....5¢ 100 sq. ft., \$1.50 to \$1.90 Galvanized Wire Netting.....75¢75&25¢
<b>Shovels and Spades.</b> Griffith's Black Iron.....50&10¢ Griffith's C. S. R. R. Goods.....60¢60&10¢ Griffith's Solid C. S. R. R. Goods.....60¢ Old Colony (Sanford Fork & Tool Co.) 20¢ St. Louis Shovel Co.....20¢20&7½¢ Hussey, Blinn & Co.....15¢25¢ Hubbard & Co.....20¢20&7½¢ Lehigh Mfg. Co.....50&10¢ Payne Petebone & Son, list January, 1886.....30¢ Remington's (Lowman's Patent).....30&10¢40¢ Rowland's, Black Iron.....50&10¢ Rowland's Steel.....60&25¢60&10¢	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Trowels.</b> Lothrop's Brick and Plastering.....25¢ Reed's Brick and Plastering.....15¢ Dixon's Br'k and Plastering, 25¢25&10¢ Peace's Plastering.....25¢ Clement & Maynard's.....30¢ Rose's Brick.....15¢20¢ Worral's Brick and Plastering.....20¢ Garden.....70¢	<b>Wire Goods.</b> See Bright Wire Goods.
<b>Shovels and Tongs.</b> Iron Head.....60&10&60&10&25¢ Brass Head.....60&10&10¢	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Trucks, Warehouse, &amp;c.—</b> B. & L. Block Co.'s list, '82.....40¢	<b>Wire Rope.</b> List May 1, 1886.....30¢ Iron.....40¢ Cast Steel.....40¢
<b>Skeins, Thimble.</b> Western list.....75&5¢75&10¢ Columbus Wrt. Steel, list Nov. 1, 1887, 20¢ Coldbrookdale Iron Co.....50&10¢ Utica P. S. T. Skeins.....60¢ Utica Turned and Fitted.....35¢	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Trunks, Warehouse, &amp;c.—</b> B. & L. Block Co.'s list, '82.....40¢	<b>Wrenches.</b> American Adjustable.....40¢ Baxter's Adjustable "S".....40&10&50¢ Baxter's Diagonal.....40&10&50¢ Coe's Genuine.....55¢35¢ Coe's "Mechanics".....55&10&35¢ Girard Standard.....70&10¢ Machinists', Sterling Wrench Co. 70&10¢ Lamson & Sessions' Engineers'.....60&10¢ Lamson & Sessions' Standard.....70&10¢ Goes' Pattern, Wrought.....80¢80&25¢ Girard Agricultural.....80¢80&25¢ Lamson & Sessions' Agric'l.....80¢80&25¢ Sterling Wrought.....80¢80&25¢ Bemis & Call's Pat. Combination.....35¢ Merrick's Pattern.....35¢ Briggs' Pattern.....25¢ Cylinder or Gas Pipe.....40&5¢ No. 3 Pipe.....40&10¢ Aiken's Pocket (Bright).....50&10¢ The Favorite Pocket.....5¢ dos \$4.00, 40¢ Webster's Pat. Combination.....25¢ Boardman's.....20&10¢ Always Ready.....25¢5¢ Alligator.....50¢ Donohue's Engineer.....20&10¢ Acme, Bright.....50&25¢ Acme, Nickel'd.....50&25¢ Walker's.....55&25¢ Diamond Steel.....55&25¢
<b>Sieves.</b> Buffalo Metallic, S. S. & Co.....50&25&10¢ Barier Flour Sifters.....5¢ dos \$2.00 Electric.....5¢ gr \$21.00 Hunter's.....5¢ gr \$18.00 Smith's Adjustable Sifters.....5¢ dos \$2.00 Smith's Adjustable Milk Strainer.....5¢ dos \$2.00 Smith's Adjustable T. & C. Strainer.....5¢ dos \$1.25	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Trunks, Warehouse, &amp;c.—</b> B. & L. Block Co.'s list, '82.....40¢	<b>Wringers, Clothes.</b> List March 11, 1889, 2¢ cash.
<b>Staves, Wooden Rim.</b> Meah 18, Nested, 5¢ dos.....70¢ Plated. Meah 20, Nested, 5¢ dos.....85¢ 1.00 Meah 24, Nested, 5¢ dos.....1.00 1.10	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Trunks, Warehouse, &amp;c.—</b> B. & L. Block Co.'s list, '82.....40¢	<b>Wrought Goods.</b> Staples, Hooks, &c., list Jan. 12, 1888, 80¢30¢4&25¢
<b>Snaps, Harness, &amp;c.—</b> Anchor (T. & Mfg. Co.).....65¢ Fitch's (Bristol).....50&10¢ Hotchkiss.....10¢ Andrews.....50¢ Sargent's Patent.....70&10&10¢ German, new list.....40&10¢ Covert, New Patent.....50&25¢ Covert, New R. F.....60¢80¢ Covert Spring.....60&10&10¢	<b>Staples.</b> Fence Staples, Galvanized.....Same price as Br'd Wire. Fence Staples, Plain.....See Tr'd Rep.	<b>Trunks, Warehouse, &amp;c.—</b> B. & L. Block Co.'s list, '82.....40¢	

# CURRENT METAL PRICES.

APRIL 3, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
1 to 2 in. round and square...	\$ 1.90 @ ..
1 to 6 in. x 1/2 to 1 in. ....	
Refined Iron:	
1 to 2 in. round and square...	\$ 2.00 @ 2.10
1 to 4 in. x 1/2 to 1 in. ....	
4 1/2 to 6 in. x 1/2 to 1 in. ....	\$ 2.20 @ 2.30
1 to 6 in. x 1/2 and 5-16 .....	\$ 2.20 @ 2.30
Rods—1/2 and 11-16 round and sq. ....	\$ 2.10 @ 2.20
Bands—1 to 6 x 8-16 to No. 12. ....	\$ 2.20 @ 2.30
"Burden Best" Iron, base price. ....	\$ 3.00 @ ..
Burden's "H. B. & S." Iron, base price. ....	\$ 2.80 @ ..
"Ulster" .....	\$ 3.10 @ ..
Norway Rods .....	\$ 4.00 @ 5.00

Merchant Steel from Store.	
Per pound.	
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots .....	2 1/2¢
Best Cast Steel, base price in small lots .....	3 1/2¢
Best Cast Steel Machinery, base price in small lots .....	5¢

Sheet Iron from Store.	
Common American. R. G. Cleaned.	
10 to 16 .....	\$ 2.75 @ 2.80
17 to 20 .....	\$ 2.85 @ 3.00
21 to 24 .....	\$ 3.00 @ 3.10
25 and 30 .....	\$ 3.20 @ 3.30
37 .....	\$ 3.35 @ 3.75
38 .....	\$ 3.50 @ 4.00
B. E. 2d qual.	
Galv'd. 14 to 20 .....	\$ 4.50 @ 4.80
Galv'd. 1 to 24 .....	\$ 4.87 1/2 @ 4.75
Galv'd. 25 to 30 .....	\$ 5.25 @ 5.12
Galv'd. 37 .....	\$ 5.83 1/2 @ 5.48
Galv'd. 38 .....	\$ 6.00 @ 5.85
Patent Planchet .....	\$ 10¢ B. 5¢
Russia .....	\$ 9 1/2¢ @ 10¢
American Cold Rolled B. B. ....	\$ 5¢ @ 7¢

English Steel from Store.	
Per lb.	
Best Cast .....	\$ 15
Extra Cast .....	\$ 16 1/2
Swaged, Cast .....	\$ 16
Best Double Shear .....	\$ 15
Blister, 1st quality .....	\$ 12
German Steel, Best .....	\$ 10
2d quality .....	\$ 9
3d quality .....	\$ 8
Sheet Cast Steel, 1st quality .....	\$ 15
2d quality .....	\$ 14
3d quality .....	\$ 12 1/2

METALS.	
Tin.	
Banca, Pigs .....	\$ 23
Straits, Pigs .....	\$ 23
English, Pigs .....	\$ 23 1/2
Straits in Bars .....	\$ 24

Tin Plates.—Bright.	
Per box.	
Melny Grade.	
IC, 10 x 14 .....	\$ 5.75 @ 6.00
IC, 12 x 12 .....	\$ 6.00 @ 6.25
IC, 14 x 12 .....	\$ 6.25 @ 6.50
IC, 16 x 12 .....	\$ 6.50 @ 6.75
IC, 18 x 12 .....	\$ 6.75 @ 7.00
IC, 20 x 12 .....	\$ 7.00 @ 7.25
IC, 22 x 12 .....	\$ 7.25 @ 7.50
IC, 24 x 12 .....	\$ 7.50 @ 7.75
IC, 26 x 12 .....	\$ 7.75 @ 8.00
IC, 28 x 12 .....	\$ 8.00 @ 8.25
IC, 30 x 12 .....	\$ 8.25 @ 8.50
IC, 32 x 12 .....	\$ 8.50 @ 8.75
IC, 34 x 12 .....	\$ 8.75 @ 9.00
IC, 36 x 12 .....	\$ 9.00 @ 9.25
IC, 38 x 12 .....	\$ 9.25 @ 9.50
IC, 40 x 12 .....	\$ 9.50 @ 9.75
IC, 42 x 12 .....	\$ 9.75 @ 10.00
IC, 44 x 12 .....	\$ 10.00 @ 10.25
IC, 46 x 12 .....	\$ 10.25 @ 10.50
IC, 48 x 12 .....	\$ 10.50 @ 10.75
IC, 50 x 12 .....	\$ 10.75 @ 11.00
IC, 52 x 12 .....	\$ 11.00 @ 11.25
IC, 54 x 12 .....	\$ 11.25 @ 11.50
IC, 56 x 12 .....	\$ 11.50 @ 11.75
IC, 58 x 12 .....	\$ 11.75 @ 12.00
IC, 60 x 12 .....	\$ 12.00 @ 12.25
IC, 62 x 12 .....	\$ 12.25 @ 12.50
IC, 64 x 12 .....	\$ 12.50 @ 12.75
IC, 66 x 12 .....	\$ 12.75 @ 13.00
IC, 68 x 12 .....	\$ 13.00 @ 13.25
IC, 70 x 12 .....	\$ 13.25 @ 13.50
IC, 72 x 12 .....	\$ 13.50 @ 13.75
IC, 74 x 12 .....	\$ 13.75 @ 14.00
IC, 76 x 12 .....	\$ 14.00 @ 14.25
IC, 78 x 12 .....	\$ 14.25 @ 14.50
IC, 80 x 12 .....	\$ 14.50 @ 14.75
IC, 82 x 12 .....	\$ 14.75 @ 15.00
IC, 84 x 12 .....	\$ 15.00 @ 15.25
IC, 86 x 12 .....	\$ 15.25 @ 15.50
IC, 88 x 12 .....	\$ 15.50 @ 15.75
IC, 90 x 12 .....	\$ 15.75 @ 16.00
IC, 92 x 12 .....	\$ 16.00 @ 16.25
IC, 94 x 12 .....	\$ 16.25 @ 16.50
IC, 96 x 12 .....	\$ 16.50 @ 16.75
IC, 98 x 12 .....	\$ 16.75 @ 17.00
IC, 100 x 12 .....	\$ 17.00 @ 17.25
IC, 102 x 12 .....	\$ 17.25 @ 17.50
IC, 104 x 12 .....	\$ 17.50 @ 17.75
IC, 106 x 12 .....	\$ 17.75 @ 18.00
IC, 108 x 12 .....	\$ 18.00 @ 18.25
IC, 110 x 12 .....	\$ 18.25 @ 18.50
IC, 112 x 12 .....	\$ 18.50 @ 18.75
IC, 114 x 12 .....	\$ 18.75 @ 19.00
IC, 116 x 12 .....	\$ 19.00 @ 19.25
IC, 118 x 12 .....	\$ 19.25 @ 19.50
IC, 120 x 12 .....	\$ 19.50 @ 19.75
IC, 122 x 12 .....	\$ 19.75 @ 20.00
IC, 124 x 12 .....	\$ 20.00 @ 20.25
IC, 126 x 12 .....	\$ 20.25 @ 20.50
IC, 128 x 12 .....	\$ 20.50 @ 20.75
IC, 130 x 12 .....	\$ 20.75 @ 21.00
IC, 132 x 12 .....	\$ 21.00 @ 21.25
IC, 134 x 12 .....	\$ 21.25 @ 21.50
IC, 136 x 12 .....	\$ 21.50 @ 21.75
IC, 138 x 12 .....	\$ 21.75 @ 22.00
IC, 140 x 12 .....	\$ 22.00 @ 22.25
IC, 142 x 12 .....	\$ 22.25 @ 22.50
IC, 144 x 12 .....	\$ 22.50 @ 22.75
IC, 146 x 12 .....	\$ 22.75 @ 23.00
IC, 148 x 12 .....	\$ 23.00 @ 23.25
IC, 150 x 12 .....	\$ 23.25 @ 23.50
IC, 152 x 12 .....	\$ 23.50 @ 23.75
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# THE IRON AGE

THURSDAY, APRIL 11, 1889.

## International Congress on Mines and Metallurgy.

Professor Egleston, of the School of Mines, informs us that the French Government has appointed an international congress on the subject of mines and metallurgy, to be held in Paris on September 2 in this year, in connection with the exposi-

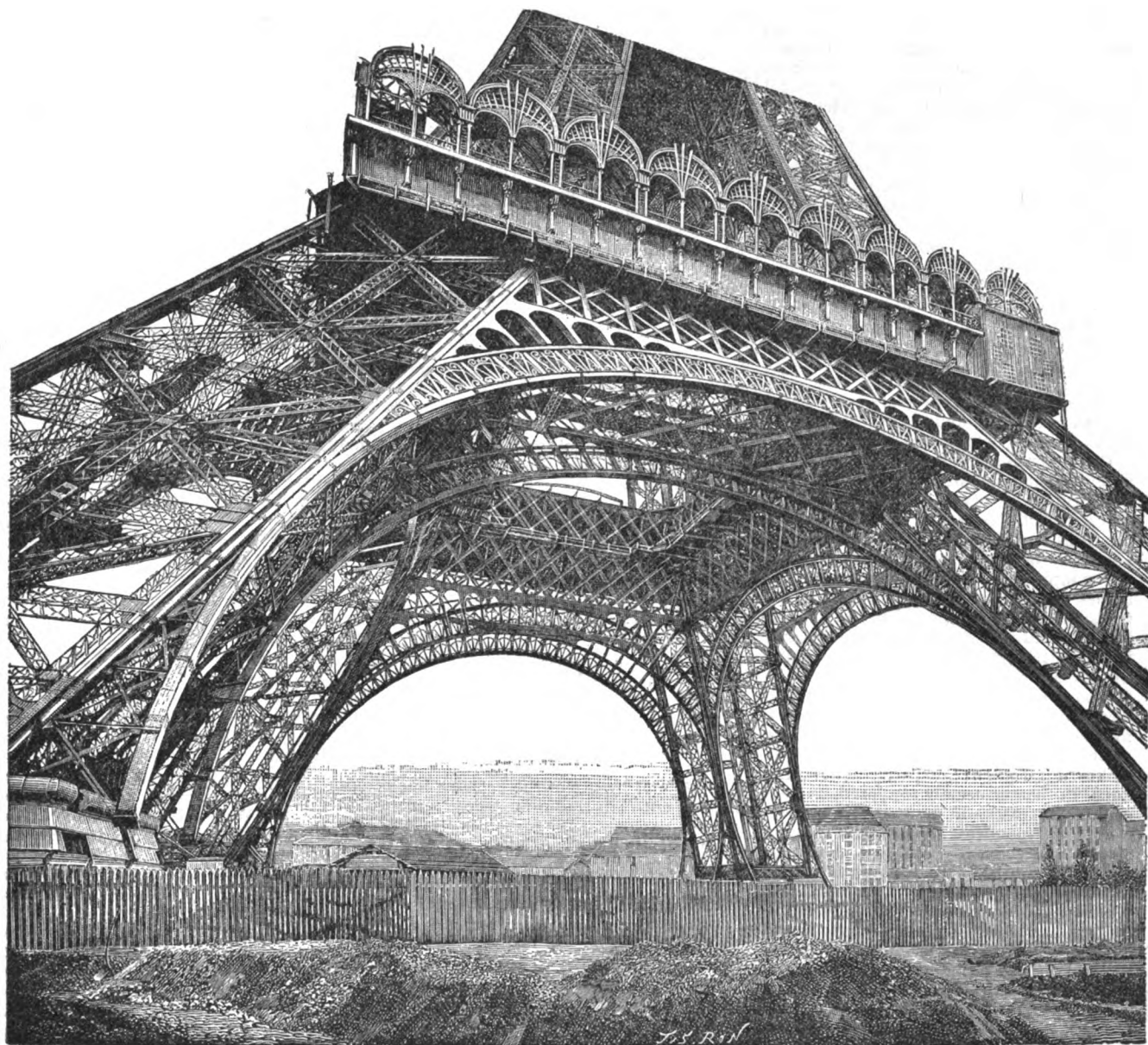
ment, and the members becoming so upon the payment of 20 francs.

Letters and communications from this country relating to the subject of mines and metallurgy may be addressed to M. Castel, inspector-general of mines and president of the organizing commission, 144 Boulevard Raspail, Paris.

The committee appointed by the French Government consists of: President, M.

## The Eiffel Tower.

The general characteristics of the famous Eiffel tower at the Paris Exposition, now completed, have become familiar to all through the drawings printed in the illustrated press. The magnitude of the work is hardly appreciated, however. No drawing gives so adequate a conception of the structure as the accompanying



THE EIFFEL TOWER.—PERSPECTIVE VIEW FROM BELOW.

tion. The congress has for its object to make known and discuss the most recent inventions and improvements in mining and metallurgy, and will have brought before it a considerable number of memoirs which have been prepared by engineers specially detailed for the purpose. These reports will be printed and distributed in advance to persons who wish to become members of the congress and will form the basis of the discussion, but other subjects may be introduced or other questions presented by the members, with the approbation of the officers in charge. The congress will consist of members and honorary members, the honorary members being appointed by the French Govern-

ment, and the members becoming so upon the payment of 20 francs. Letters and communications from this country relating to the subject of mines and metallurgy may be addressed to M. Castel, inspector-general of mines and president of the organizing commission, 144 Boulevard Raspail, Paris. The committee appointed by the French Government consists of: President, M. Castel, Inspector-General of Mines, president of the Society of Mineral Industry; vice-presidents: M. Brüll, past president of the Society of Civil Engineers, in Paris; M. Haton de la Goupillière, member of the institute, Inspector-General of Mines, director of the School of Mines, of Paris; M. Jordan, professor of metallurgy at the Central School, past president of the Society of Civil Engineers, of Paris; M. Rémaury, civil engineer of mines. Secretaries: M. Dujardin-Beaumetz, secretary of the Central Committee of Coal Mines; M. Gautier, civil engineer of mines; M. E. Gruner, civil engineer of mines; M. Lodin, engineer of mines, professor of metallurgy at the School of Mines, in Paris.

perspective view, for which we are indebted to the *Génie Civil*, whose editor, Max de Nausonty, eloquently describes the impression it makes. The photograph, which embraces that part of the tower below the first story, was taken at a short distance from the base, showing its four legs, in which the elevators will run.

California has had the best possible weather for growing crops, and the most conservative predict a yield of about 60,000,000 bushels of wheat and 20,000,000 to 25,000,000 bushels of barley. As to fruit, it is agreed that the yield will be enormous.



### Tests of Foundry Mixtures.

It is admitted that foundry practice has made but little important advance in the past generation. Beyond some improvements in molding, a little better knowledge of mixtures of iron and some recent study of the use of ferro-aluminium, ferro-silicon, &c., this whole great industry is practically where it was 25 years ago. There are exceptions to this rule. A few wide-awake, energetic foundrymen, under the stress of keen competition for important work, have experimented successfully with lower grades and reached results both as to economy and quality hitherto deemed impossible. In nine-tenths of all foundries, however, one or other of the two conditions prevails: Either the shop is so full of work and crowded to get out castings on time and in good order that the responsible head cannot find time and thought for careful experiments, or else a state of ancient and rock-rooted prejudice exists that forbids any departure from the good old ways of the fathers. Under either of these conditions the chance for progress is small. It is an unfortunate circumstance also that intelligent, well-equipped foundrymen, with some little acquaintance with books and theory and good practical experience, are scarce, and when found are expensive men. And, parenthetically, it might be remarked that in these days of overcrowded professions and callings the young man who wants to make a sure thing of success in life has only to acquire a fair technical education and supplement it with practical foundry work to open the doors of many profitable places.

Our attention has been called of late to an extended series of experiments in this line made by Rogers, Brown & Co., Cincinnati and Chicago; 119 distinct foundry mixtures are covered by these tests; in all about 800 bars were broken. The standard adopted is an inch square bar, 24 inches between supports and broken by transverse pressure applied in the center. It was noted that nearly all bars overran in size from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch, making the actual breaking strength from 50 to 800 pounds greater than the correct result after being reduced by mathematical formula to inch square. This scarcely noticeable difference in the size of bars makes a far greater disparity in breaking strength than is usually supposed, and accounts for cases of unusual strength reported in foundries where only average results are realized. The bars for these tests were furnished by leading foundries in the West, particularly Ohio, Indiana, Missouri and the Northwest. They represent all classes of work—agricultural machinery, general machinery, architectural work, jobbing, stove plate, hardware, &c. The mixtures used are from coke and charcoal irons, mainly the former. The proportion of foundries using charcoal iron at all is less than 20 per cent. Those using it in any considerable proportion scarcely amount to 8 per cent. These are mainly in the Northwest, where Lake Superior charcoal iron has been a recognized standard for years and is slow to give place to newer mixtures.

One of the most interesting facts brought out is the average strength of about 300 test bars broken. This is 1120 pounds, and it may fairly be assumed that this is the average strength of all foundry mixtures west of the Alleghenies. Exclusive of bars containing flaws, and of which no account was made in the inquiry, 37 broke below 1000 pounds, only 12 broke above 1400 pounds and 3 above 1500 pounds. One bar in which wrought-iron scrap and ferro-aluminium were mixed with pig iron broke at 1958 pounds, the strongest of the series, but it was hard to drill or work.

The two weakest bars were made from a mixture of half each Lake Superior charcoal No. 1 (a favorite brand) and old car-wheels. The strongest bar, other than the one above named, was from an all-coke iron mixture, in which Lake Superior, Southern and Hanging Rock ores were about equally blended. It is clearly proved by the experiments that it is rather by the intelligent mixing of medium-grade irons than by the use of the strongest and highest-priced brands that best results are achieved. In several conspicuous cases, where the highest-priced Lake Superior charcoal irons were mixed with best-known Northern Ohio soft or "Scotch" brands, the object being to "get the best," without reference to price, the results were below the general average, while of the very strongest mixtures a majority were from the cheaper brands. In scarcely a single instance where Hanging Rock, Lake Superior and Alabama or Tennessee coke irons, of proper grades, were mixed in judicious proportions was a weak, hard or defective casting obtained. Some low-grade and low-cost mixtures, thus judiciously made up, yielded strength and general working qualities that were quite surprising. In such adaptations Nos. 2 and 3 grades were freely used without rendering work too hard for machine shop. Wrongly adapted, the same grades would doubtless yield hard and brittle castings.

The bending capacity or deflection of bars was in each case noted. The maximum test was  $\frac{1}{16}$  inch, the breaking strength 1435 pounds. The minimum test was  $\frac{1}{4}$  inch, the breaking strength being 845 pounds. In color and grain results were conflicting. The darkest fractures and those of the cleanest, sharpest grain were sometimes among the weakest, but as a rule were of good strength and soft. A mixture with too much silicon invariably proved weak and brittle, while too little silicon produced physical results very similar. An interchange of views and information was had among the foundrymen taking part in these tests as to facts of foundry practice, methods of charging cupolas, pressure of blast at tuyeres, kind and proportions of fuel used, &c., and it is promised that a summary of the results of these will be given at a later time.

A *bon mot* by one of the veterans in the Eastern cut-nail trade is being widely quoted. At one of the recent meetings of the manufacturers the delicate question of distributing allotment was being discussed. One of the younger manufacturers, who is described as a progressive and energetic though somewhat impetuous man, in pressing his claims for a larger percentage dwelt upon his ability to produce cheaply. After imparting to his colleagues that he was using skelp scrap, costing 1 cent a pound, as a raw material, he was about to leave the conference when the chairman quietly suggested that in his long experience as a nail-maker this was the first case in which he had known a skelp mill to be run to furnish raw material for cut-nail manufacture. The skelp-scrap-nail maker stopped to explain and the impending rupture was averted.

Ryan & McDonald, of Waterloo, N. Y., manufacturers of contractors' supplies, including hoisting and mining engines, derrick fittings, winches, drums, dump and flat cars for construction of railroads, brickyard and stone quarry use, are shipping large orders for their goods. Last week they sent a double-cylinder double-drum hoisting engine to Wilkesbarre, Pa.; 30 dump cars to Brooklyn, N. Y.; 12 rotary dump cars into New Jersey, 50 into Pennsylvania, several smaller orders to brickmakers, and will add several thou-

sand dollars' worth of new and special machinery to their already large plant. They propose to double their capacity during 1889.

### The Armored Coast-Defense Vessel.

Great interest was felt at the Navy Department on Monday in the opening of the bids for the armored coast-defense vessel. It was concluded generally that the figures proposed (the lowest being \$1,614,000) constituted a fair price for the work, and the closeness of the bidding was remarkable. The appropriation act under which the vessel is proposed to be built imposed a severe limitation. It limited to \$2,000,000 the cost (exclusive of armor and guns) of floating rams or other naval defensive structures. This implied that the \$2,000,000 was to provide for the construction of more than one such defensive structure. A torpedo-boat had been contracted for at a cost of \$87,000, and this left a little over \$1,900,000 available, out of which, besides the vessel and machinery, anchors, boats, &c., were to be supplied. So there is much gratification felt at the fact that the proposals received were within the available appropriation. There are many features of interest about the new craft. One connected with the boilers has apparently given much trouble to the bidders and may influence the award of the contract. The specifications provide for two ordinary return tubular marine boilers of 1500 horse-power, but the remainder of the 5400 horse-power required is to be supplied by coil boilers. These have been tried with great success on yachts, and in a modified form by the French Government, but their use in naval vessels will be largely experimental. If they come up to expectations they will result in a large saving of space and weight. But at least one bidder—Cramp—does not feel confident of the result, for he proposed to enlarge the two tubular boilers, and in consideration of this departure from the designs to waive all claim to any bonus for horse-power in excess of 5400. The next lowest bidder—the Union Iron Works—agreed to accept the Department's plan and guarantee results.

The new vessel will be a departure in design from any vessel in the navy, and Captain Hichborn, who is acting as Chief of the Bureau of Construction, is confident that she will be the most formidable vessel for her displacement of any in the world, and able to cope with anything afloat. She approximates the monitor type, and is of 5000 tons displacement in cruising trim. When she goes into action, by taking on water ballast she sinks until her deck is but 16 inches above the water level, thus diminishing the size of the target exposed to an opponent. The sides covering the machinery are to be covered with 16 inches of armor, besides the protection afforded by the coal bunkers. The barbettes containing the guns are to be of 16-inch steel, and the deck will be of steel 2 inches thick. She will be 261 feet long, 49 feet beam, 14½ feet draft, and have a speed of 16 knots. At this speed she can steam 632 miles, but at ordinary cruising speed (about 9 knots) she would travel 2727 miles without renewing her coal supply. But the most remarkable feature will be the tremendous power of her armament. In the forward barrette mounted on a turntable and manipulated by hydraulic power she will carry a 16-inch rifle weighing 110 tons and 49 feet long, one of the largest guns afloat. In the rear barrette there will be a 12-inch rifle weighing 46½ tons. A 15-inch dynamite gun 50 feet long will project from the bow, and in other places the vessel will carry six 33-pounders, three 9-pounders, two 6-pounders and four 3-pounders, all revolving cannons and rapid-fire

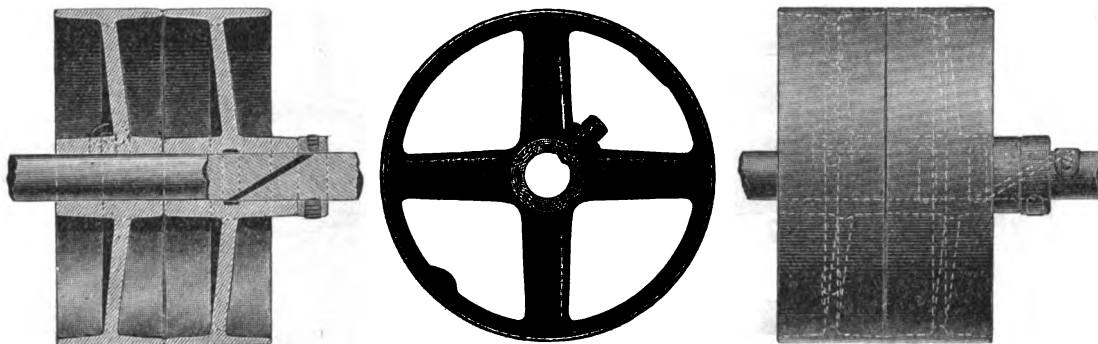
guns. Machine guns and electric search lights on a hollow steel military mast will complete the ship, which will take three and a half years to build.

#### Lubricating Loose Pulleys.

This method of lubricating loose pulleys is the invention of John L. Bogert, of Flushing, N. Y. It consists of an oil-hole running diagonally across the shaft and which admits the lubricant to an annular

every afternoon. That part of the shop wall directly behind it had been changed from white to dark brown by the flying oil. The above-described method of lubrication was tried, the hub of the loose pulley being bored out with an annular groove that would hold about 2 teaspoonfuls of oil. After this it ran perfectly for three weeks without being touched, and then seized. An examination showed that there was plenty of oil and that the groove was full of grit, no cover or dust-guard having been used. The pulley ran without caus-

grip of the jaws, but the clamp-jaws prevent any loosening movement of wheel away from the face of the chuck. These chucks are universal and operated by means of screws, pinion and rack; they are, of course, self-controlling, and are attached to the lathe or boring-mill generally by means of a face-plate turned off to fit the seat for that purpose in back of chucks, which if properly done will insure the true running of the chuck and its holding a wheel or tire practically true while being bored or turned. By the use of these chucks



BOGERT'S METHOD OF LUBRICATING LOOSE PULLEYS.

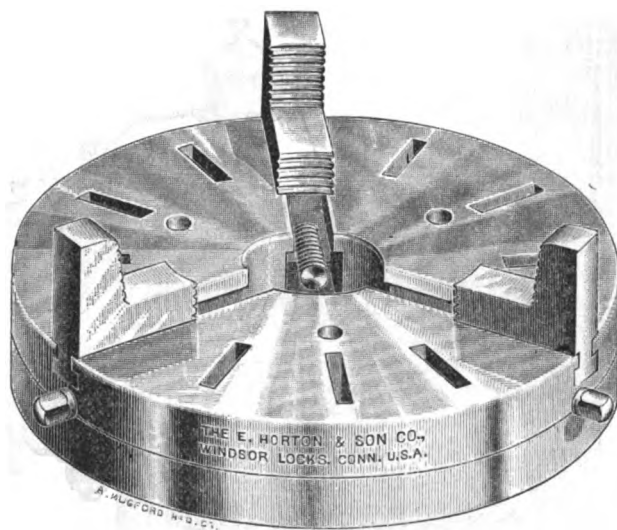
groove formed in the inside of the hub of the pulley. A removable plug or cap covers the outer opening of the oil-hole and prevents the entrance of dust. When the pulley is revolving the groove can be filled with oil by removing the cap, the shaft being stationary. As there is a current of air through the hole when the pulley is revolving, it is necessary to cover the external opening in order that the bearing may not be covered with grit drawn in from the atmosphere. When both shaft

ing any trouble after a cover had been applied to the oil-hole opening; it has run ever since and is never oiled more frequently than every other week.

#### Car-Wheel Chuck.

The accompanying cut represents a 42-inch car-wheel chuck made by the E. Horton & Son Company, of Windsor Locks, Conn. The main difference between this and the regular car-wheel

much time is saved in adjusting work and accuracy is insured. The faces of the permanent jaws are true with the face of chuck, and the bite is made at an angle of 8° unless otherwise ordered, so as to correspond with the shape of flange and tread of wheel. The chuck will take in work from 42½ inches in diameter down to 6 inches. When made with jaws with steps, or common jaws for general lathe work, it is claimed to make the strongest and largest universal chuck in existence.



42-INCH CAR-WHEEL CHUCK.

and pulley are revolving, the escape of the oil through the hole is prevented by centrifugal force; when both are stationary the oil settles in the annular chamber. The shaft is not materially weakened, since, the hole being diagonal, only a small part of metal is removed from the section. The use of this method by Mr. Bogert in his own factory is thus described: The countershaft of a small lathe used by his pattern-makers for wood turning runs 750 revolutions per minute. As originally made it had the customary oil-hole through the hub of the loose pulley. This gave trouble and required frequent rebushing. It was oiled every morning and

chuck made by the same company is the increased strength, the manner of inserting the jaws into the body and the provision of so-called clamp-jaws. The latter (not shown in the engraving) are intended to hold the wheel or tire more firmly in the grip of the permanent jaws. The clamp-jaws are L-shaped and are dovetailed so as to slide on the outer surface of the permanent jaws, the short leg of the L extending over the wheel held. These jaws are moved by screws entering threaded holes in the end of the permanent jaws. The bites of the latter are made to fit the tread of the wheel, which has a tendency to become loosened and pull out of the

**Machinery for the Texas.**—The plans and specifications for the machinery of the armored battleship Texas were received by the Quintard Iron Works on Monday. The Texas is building at the Norfolk Navy Yard, and, like the Maine, her machinery construction is offered to private firms for contract work. The plans have only been sent out from the Department during the last week, and are ready to be sent to any one who may be inclined to bid upon the work. The plans and drawings were opened up in the drafting-rooms of the Quintard Works, and hastily placed in comparison with the drawings of the Maine's machinery. So far as a cursory glance could determine, the most apparent difference between the designs is in the bed-plates, and also in the form of the steel columns. In the Maine these columns are single and apparently simple in form, while in the Texas's designs they are in the form of a Y. This latter form is the same as is seen on the Inman liner City of New York, and is purely an English feature. The boilers for the Texas differ from the design of those for the Maine in being placed fore and aft, having forward and aft firerooms. The shafting for the Texas is shown to be similar to that designed for the Maine. In other respects the machinery for the two vessels appears, on the whole, very similar, and leads one to believe that it will not be a much harder undertaking than the construction of the Maine. The weight of the boilers for the Texas is 53 tons, being much greater and more unwieldy than those of the cruiser. The shell of the Texas boilers is of very great thickness, which accounts somewhat for the weight. The design for the battleship's hull and machinery came from the Barrow Ship-building Company, of England.

### The Forward Gas Engine.

The distinguishing feature of this gas engine, which is manufactured by T. B. Barker & Co., of England, and the United

receives inflammable gas from the fixed gas duct  $j$  in the cover  $b$ , the passage  $j^2$  in the rotating disk  $a$  being brought opposite during the motion of the said disk, and communicating with the duct or curved

in the fixed cover  $b$ , which duct  $f^3$  communicates with the port  $g$  of the small gas chamber  $f g$ .

By the action of the ratchet motion the small gas chamber  $f g$  in the disk  $a$ , hav-

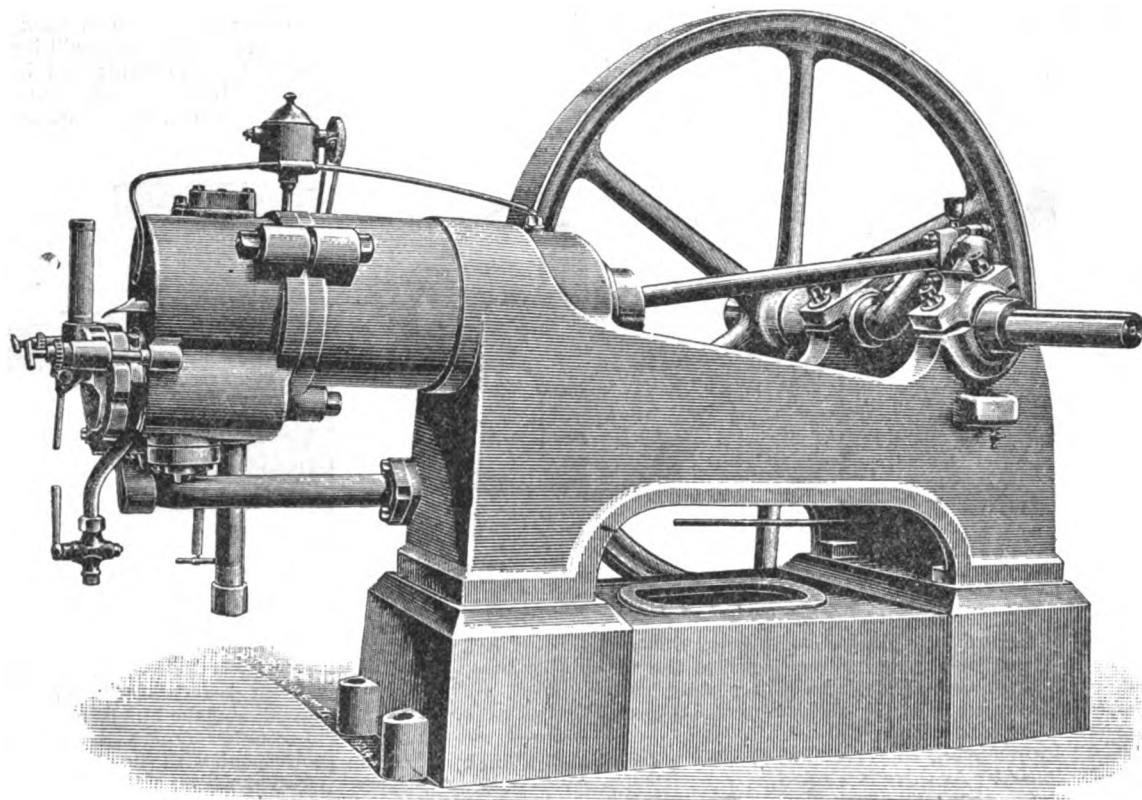


Fig. 1.

States patents of which are in the hands of Philip S. Justice & Co., of Philadelphia, is a rotating valve by which the ignition of the combustible charge in the cylinder is effected. In the valve are eight ignition ports, which come into action successively. Each port having performed its duty makes a complete revolution before it comes into action again, and in the meantime is exposed to the air, by which the greater part of the heat which it has absorbed is carried away. This insures the cool working of the valve, which runs scarcely any risk of cutting, while the constant motion in one direction affords another element of safety. Every time the cylinder takes in a charge the valve gives a partial revolution, but when the gas is cut off completely the valve ceases to move, and the small firing charge, which would otherwise be wasted, is saved. The number of missed explosions is not, however, great in this engine, as the strength of the charge is reduced as the work falls off until it approaches the point at which it would cease to explode; the gas is then cut off entirely, and the valve left stationary until the governor arms again fall. The mechanical devices by means of which these operations are performed are shown by the accompanying cuts, which illustrate a 4 horse-power engine constructed in accordance with the patents of T. B. Barker. The valve  $a$  is mounted on a pivot at the rear of the combustion chamber of the cylinder, and has a number of ratchet teeth,  $e$ , around its circumference. It is rotated by a pawl,  $l$ , worked by a small crank at the end of the side shaft and a connecting link,  $n$ . The cylinder being charged with compressed explosive mixture, the port  $d$  is also charged with the gaseous mixture. The disk  $a$  is by the intermittent motion imparted to it brought into position at the required time for igniting the mixture in the cylinder. The slot or small gas chamber  $f g$  in the disk  $a$ , which is approaching the port  $d$ ,

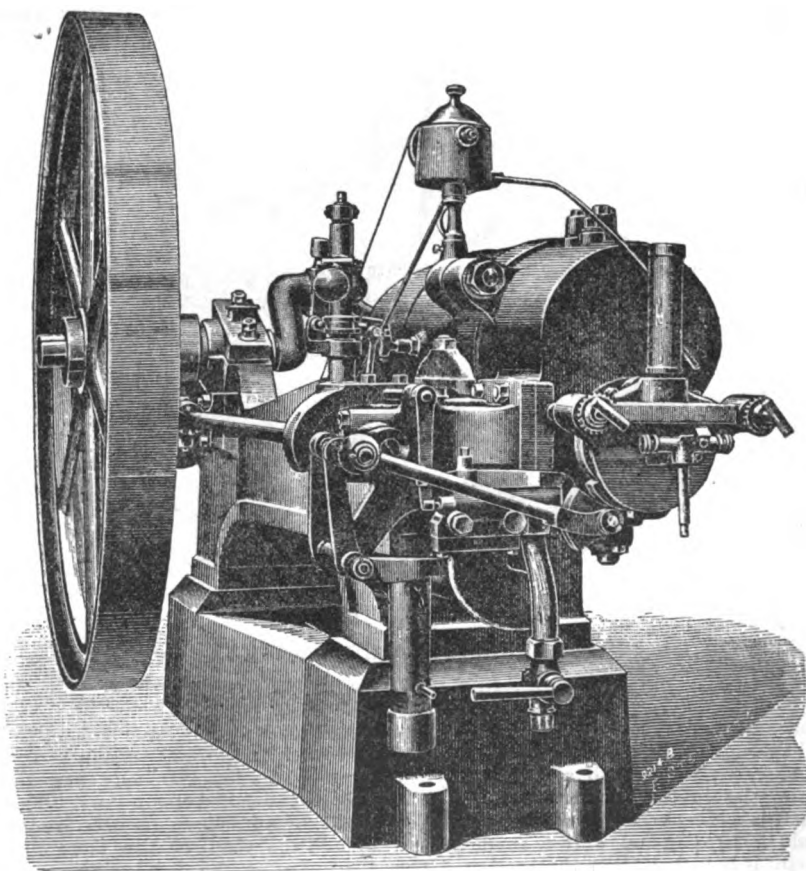


Fig. 2.

### THE FORWARD GAS ENGINE.

slot  $j$  in the cover  $b$ . The slot or small gas chamber  $f g$  receives atmospheric air to form an inflammable mixture with the gas in the small chamber through the duct  $j^2$

ing been charged in the manner described, is carried rapidly forward, and the gaseous mixture therein is ignited by the fixed relighting gas jet  $h^1$ . The igniting

of the charge in the small gas chamber  $f$   $g$  takes place immediately before the passage  $h$  comes opposite the port  $d$  into the gas cylinder  $a^2$ . The passage  $h$  coming opposite the port  $d$ , the flame in the small gas chamber  $f$   $g$  ignites the gaseous mixture in the port  $d$  and the engine cylinder  $a^2$ . The passage  $h$  opens into the port  $g$  of the small gas chamber  $f$   $g$  imme-

tappet valve, the cam  $p^1$  operates upon the lever  $p$ , causing the stud  $q$  to be disengaged from the slot, and allowing the pawl to fall into the teeth of the valve. When the engine is running so fast that the gas-valve is not opened, the stud holds the pawl out of gear.

This engine has been subjected to a series of tests by Prof. R. H. Smith, of

Fig. 7 a high-pressure card illustrating how the governor supplies a richer charge of gas when any sudden demand is made on the engine. At half-power the brake horse-power was 3.084, equal to a gas consumption of 81.86 feet per horse-power per hour. The lighting jet burned about 2 feet an hour in both cases. When the engine was running empty it burned 53

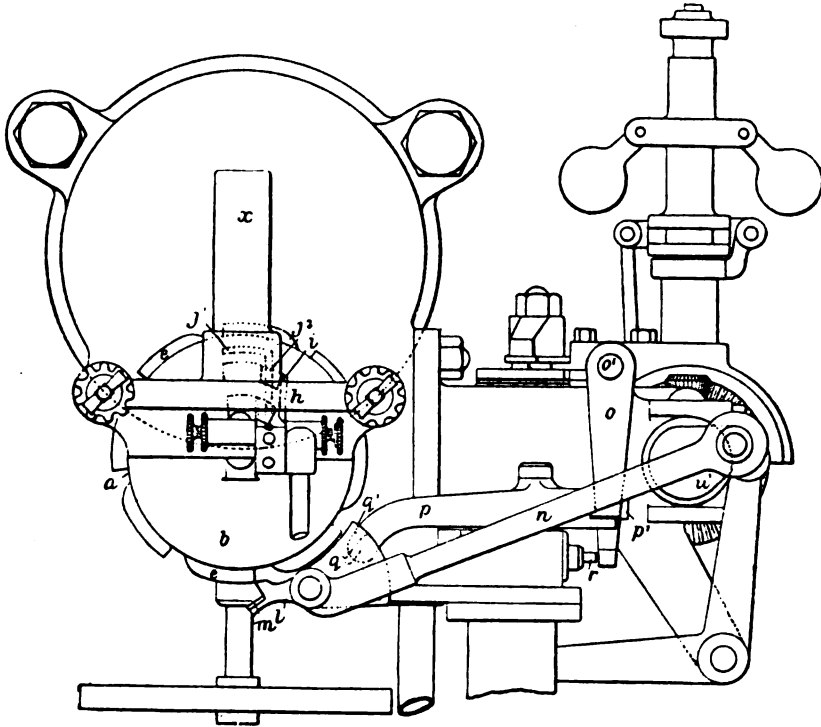


Fig. 3.

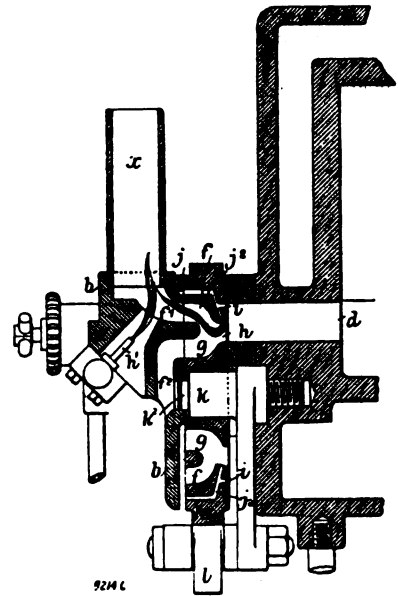


Fig. 4.

diately after the said small gas chamber and the port  $f^2$  are closed, the duct  $i$  communicating with the port  $d$  a little before the port  $h$  communicates with the port  $d$  to effect the ignition of the gaseous mixture in the gas chamber or cylinder  $a^2$ .

The supply of gas is regulated by the lever  $o$  and the gas-valve  $r$ . The lever re-

Mason College, Birmingham, and has given most satisfactory and economical results. It was tried at full working load, at half load and unloaded, the latter test being divided into three parts—at fast, medium and slow speeds. The full working load trial lasted 85 minutes, the speed being 176.86 revolutions per minute. The

feet of gas per hour at the high speed, 44 feet at the medium speed and 34 feet at the low speed. A comparison of these results with those obtained in the Society of Arts trials in England shows that the

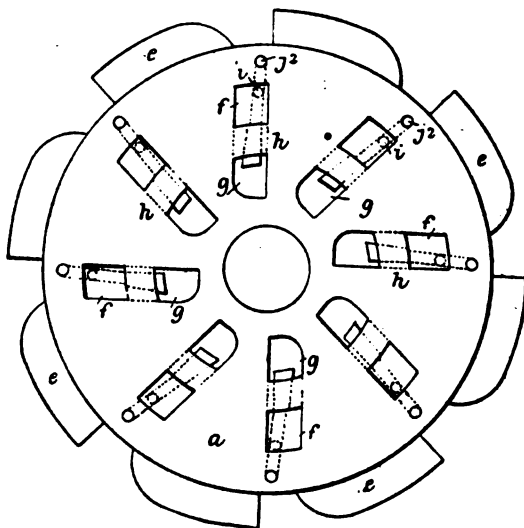


Fig. 5.

#### THE FORWARD GAS ENGINE.

ceives its motion through a spindle,  $o^1$ , from a second lever, which is acted upon by a cam on the side shaft. This cam is under the control of the governor. The lever  $o$  carries a cam,  $p^1$ , which engages with a lever,  $p$ , having at its end a stud,  $q^1$ , taking into a slot,  $q$ , in the pawl  $l$ . Upon the lever  $o$  moving so as to open the gas

indicated horse-power was 5.54, and the brake horse-power 4.807, giving a mechanical efficiency of 0.8677. The gas consumed in driving the engine was 163.2 feet, or 20.79 cubic feet per hour per indicated horse-power and 23.97 feet per brake horse-power. Fig. 6 shows an average indicator card taken during this trial, and



Initial Pressure..... 165 lbs. per sq. in.  
Average Mean Pressure..... 65.11  
Revolutions per minute..... 177

Fig. 6.

Forward gas engine ranks among the best in the market in the matter of economy, while its mechanical simplicity is a great additional recommendation.

The New York Iron and Chemical Company's shop, at Long Island City, was destroyed on Saturday by a fire, which broke out in the tanks of the Empire Re-



Initial Pressure..... 230 lbs. per sq. in.  
Average Mean Pressure..... 77.73  
Revolutions per minute..... 176

Fig. 7.

finery. There was a two-story brick and frame structure in which scrap tin was treated chemically to remove the tin from the sheet iron. The loss was put at \$40,000.

### Iron Chimney Stacks.

In many places, notably in ironworks, iron stacks are preferred to brick chimneys. Their efficiency for the same dimensions is somewhat higher, because there is no infiltration of air through the brickwork. The stacks of the Pennsylvania Steel Company, at Sparrow's Point, Md., of which we herewith present a sectional elevation and plan at the base, are lined with brick their whole height, and are bolted down to the base, so as to require no stays, though in this case they would be sufficiently stable from their own weight. A good method of securing such bolts to the stack is practiced by the Pencoyd Iron Works, and is shown in detail in the annexed cuts. Iron stacks require to be

the chimney. The relation is expressed in the equation

$$C \frac{d h^3}{b} = W$$

in which  $d$  = the average breadth of the shaft;  $h$  = height;  $b$  = the breadth of base; all in feet;  $W$  = weight of chimney in pounds, and  $C$  = a co-efficient of wind pressure per square foot of  $a$ . This varies with the cross-section of the chimney and = 56 for a square, 85 for an octagon and 28 for a round chimney. Thus a square chimney of average breadth of 8 feet, 10 feet wide at the base and 100 feet high, would require to weigh  $56 \times 8 \times 100 \times 10 = 448,000$  pounds to withstand any gale likely to be experienced. Brickwork weighs from 100 to 180 pounds per cubic foot, hence such a chimney must

Dia. in inches.	HEIGHT OF CHIMNEYS.											Effective Area, square ft.	Actual Area, square ft.	Side of square of approximate area, inches.
	50 ft.	60 ft.	70 ft.	80 ft.	90 ft.	100 ft.	110 ft.	125 ft.	150 ft.	175 ft.	200 ft.			
	Commercial Horse-Power.													
18	23	25	27									0.97	2.77	16
21	35	38	41									1.47	2.41	19
24	49	54	58	62								2.08	3.14	22
27	65	72	78	83								2.78	3.98	24
30	84	92	100	107	113							3.58	4.91	27
33		115	125	133	141							4.47	5.94	30
36		141	152	163	173	182						5.47	7.07	32
39			183	196	208	219						6.57	8.30	35
42			216	231	245	258	271					7.76	9.62	38
48				311	330	348	365	389				10.44	12.57	43
54				363	427	449	472	503	551			13.51	15.90	48
60				505	539	565	593	632	692	748		16.98	19.64	54
66					658	694	728	776	849	918		20.83	23.76	59
72					792	835	876	934	1023	1105	1181	25.08	28.27	64
78						995	1038	1107	1212	1310	1400	29.73	33.18	70
84						1163	1214	1294	1418	1531	1637	34.76	38.48	75
90						1344	1415	1496	1639	1770	1893	40.19	44.18	80
96						1537	1616	1720	1876	2027	2167	46.01	50.27	86

Sizes of Chimneys with Appropriate Horse-Power Boilers.

kept well painted to prevent rust, and generally, where not bolted down, as here shown, they need to be braced by rods or wires to surrounding objects. With four such braces attached to an angle iron ring at two-thirds the height of the stack, and spreading laterally at least an equal distance, each brace should have an area in

average 18 inches thick to be safe. A round stack could weigh half as much or have less base.

#### HORSE-POWER OF CHIMNEYS.

The effective area of a chimney for a given power varies inversely as the square root of its height. The actual area, in practice, should be greater because of retardation of velocity due to friction against the walls. On the basis that this is equal to a layer of air 2 inches thick over the whole interior surface, and that a commercial horse-power requires the consumption on an average of 5 pounds of coal per hour, we have the following formulæ:

$$E = \frac{0.3 H}{\sqrt{h}} = A - 0.6 \sqrt{A}$$

$$H = 3.33 E \sqrt{h}$$

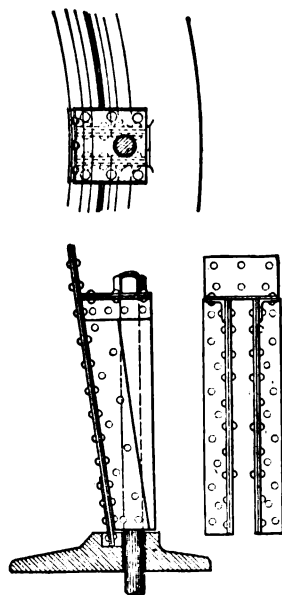
$$S = 12 \sqrt{E + 4}$$

$$D = 13.54 \sqrt{E + 4}$$

$$h = \left( \frac{0.3 H}{E} \right)^2$$

In which  $H$  = horse-power;  $h$  = height of chimney in feet;  $E$  = effective area, and  $A$  = actual area in square feet;  $S$  = side of square chimney;  $D$  = diameter of round chimney in inches. The accompanying table is calculated by means of these formulæ. For the foregoing valuable data we are indebted to *Steam*, issued by the Babcock & Wilcox Company, of this city.

The Sperry Electric Company, 194 to 198 South Clinton street, Chicago, have issued a very neat little pamphlet descriptive of the Sperry automatic safe system for electric arc lighting. In addition to the claim made for safety they call special attention to a number of other technical advantages which they say are realized in the use of this system. A large number of testimonials are printed from persons who have introduced the company's various electrical devices, and have found them to give entire satisfaction.

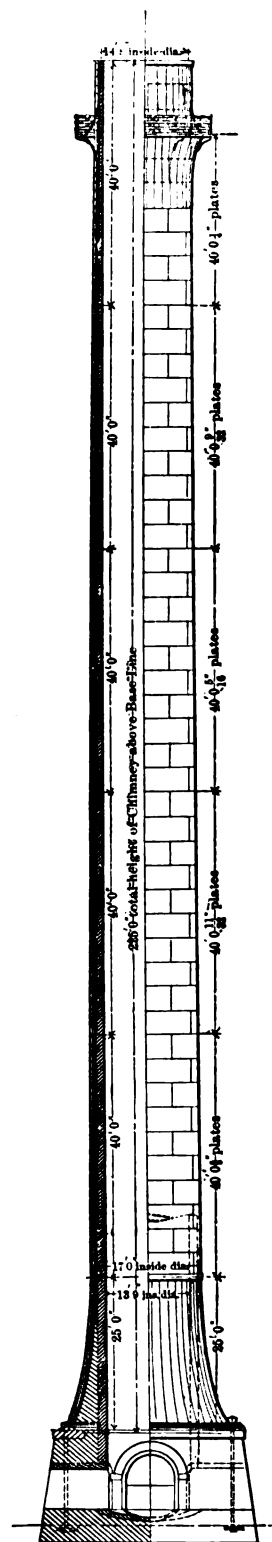


Holding-Down Bolts and Lugs, Pencoyd Iron Works.

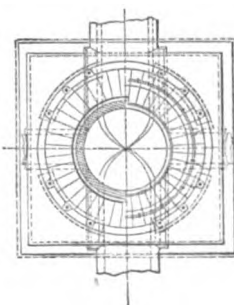
square inches equal to  $\frac{1}{1000}$  the exposed area of the stack (diameter  $\times$  height) in feet.

#### THE STABILITY

or power to withstand the overturning force of the highest winds requires a proportionate relation between the weight, height, breadth of base and exposed area of



Sectional Elevation.



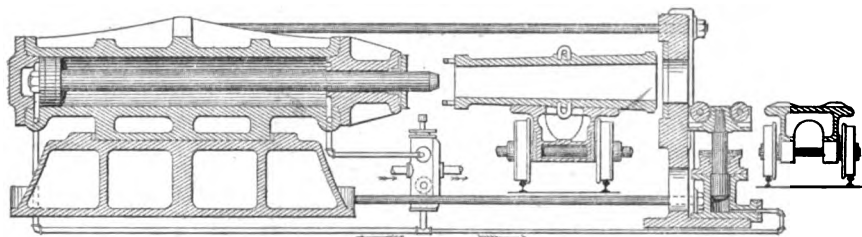
Plan.

Stack of Pennsylvania Steel Company.



### The Jones Ingot-Pusher.

One of the minor improvements introduced at the Edgar Thomson Steel Works at Braddock, Pa., during the past year has been the addition to the plant of two ingot-pushers designed by William R. Jones, general manager of the works, and patented by him January 1, 1889. In order to relieve the pit, where usually the work of stripping the molds from the ingots is performed, Captain Jones picks up the mold and ingot bodily and transfers it to a car, which is hauled outside of the mill where the pusher is located. The accompanying section clearly shows the construction. The apparatus consists of a



THE JONES INGOT-PUSHER.

hydraulic cylinder mounted horizontally on a frame, and provided with the usual water-supply pipes. In front of the cylinder is an upright frame connected with the cylinder supporting frame by heavy brace rods. The position of the ingot mold and ingot is shown in the drawing, the pusher piston ejecting the ingot through the opening in the upright frame and over the rollers back of it on the bed of the car placed in a position to receive it. The body of the ingot then rests upon the car and its rear end rests on the rollers of the table back of the upright frame, so that the car cannot be moved to bring it into position to receive another ingot without displacing the ingot unless the table be removed; this is effected by reversing the valve shown below the forward end of the plunger, thus admitting water to the front end of the pusher cylinder, forcing it back. At the same time it allows the water to escape from the cylinder of the table back of the upright frame, and causes the supporting table to drop by gravity out of the way of the ingot.

### The Boiler-Makers' Meeting.

A. T. Doughthett, secretary, has issued the following circular:

At a preliminary meeting of the local contingent of boiler manufacturers, held in Pittsburgh, March 20, 1889, it was decided to invite the manufacturers of Pennsylvania and adjacent States to meet in convention at Hotel Anderson, Pittsburgh, Pa., on Tuesday, April 16, 9 o'clock a.m., and that the sense of the meeting might be made known, the following resolutions were passed merely as a suggestion of the line of thought to be followed by the convention:

*Whereas*, The exigencies of our business, on account of the many combinations in other departments of trade with which we have to deal, have placed us in such a position that it devolves upon us to protect ourselves in a manner best suited to our case; and

*Whereas*, No business calls for greater care, better material in the construction of its commodity and more exact workmanship than ours; and in view of the fact that so many disastrous explosions have occurred in the past where material afterward tested has been shown to be of inferior quality; therefore, that we may better secure safety to the lives and the prop-

erty of every community where boilers are used, be it

*Resolved*, 1. That we establish a minimum price or scale of prices for steam boilers below which no manufacturer shall be permitted to sell.

2. That we will in all cases use the best material, refusing to accept contracts where specifications do not call for material of suitable quality to be used in the construction of steam boilers.

3. That we invite all manufacturers of boilers to join our association, knowing as we do that our object is purely philanthropic, and that while we are benefiting ourselves, we are at the same time bestowing one of the greatest blessings upon the

public at large, who should look with distrust upon any manufacturer who, by reason of personal motives, refuses to take this important step.

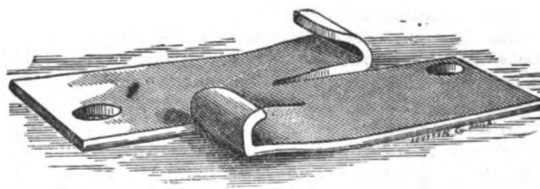
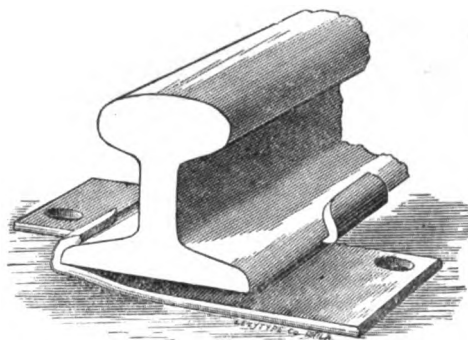
### Elastic Rail-Supporter.

In previous issues of *The Iron Age* we have had occasion to mention the enormous inroads made by the wooden tie upon our fast-disappearing forests and to de-

the supporter alone and also showing the rail in place, meets every possible objection to iron or rock sleepers, and in view of its cheapness, simplicity and facility of application, may be applied to every kind of sleeper known. It is stated that it will prevent the cutting of the rail into the wooden tie and will render the track more elastic than wood ties, especially when the ties are of hard wood or embedded in hard ballast. The fastening to the ties is very simple and is made by bolts, spikes, latches or wedges, as may be most suitable to the material and shape of the tie. To obtain noiselessness, still more elasticity, to keep out moisture and to prevent sliding or working between the spring-plate and ties, there can be placed under the plate a piece of asphalt felt or any other comparatively soft material. The elastic tie plate is constructed in such a way, as will appear by the sketch, that it can be replaced without removing the rail by simply loosening the bolts and turning the plate to an angle of 45°, when the clips will clear the rail. These ties are made by the Elastic Tie Plate Company, of New York City.

### The Kelly & Jones Company.

One of the largest and most complete establishments of its kind in the country is that of the Kelly & Jones Company, located at Huff Station, on the southwest branch of the Pennsylvania Railroad, about 33 miles from Pittsburgh. The firm are engaged in the manufacture of specialties for the steam-heating trade, consisting of cast and malleable iron fittings, globe and angle valves, heavy fittings in brass and iron for hydraulic and natural-gas works, mill and mining supplies, machinists' and steam-fitters' tools, besides a variety of smaller castings in use in the dif-



THE ELASTIC RAIL-SUPPORTER.

scribe the attempts made to substitute metal. By means of tables we have compared the cost of both and have presented estimates of total cost for an extended time. It is not necessary, therefore, to now repeat or to present a *résumé* of the advantages and disadvantages of the methods of supporting rails. In any system of securing and supporting the rails it is essential to provide a certain degree of elasticity, which not only affects the durability of the ties, rails and rolling-stock, but largely controls the noise and easy rolling of the train. It is claimed that the elastic rail-supporter, of which we herewith present two engravings, showing

ferent trades. Until the present year the works of this firm were located at Jersey City, N. J., but, desiring to avail themselves of the advantages of natural gas and at the same time secure additional facilities for the manufacture of their goods, the plant was removed to Huff Station, on the outskirts of Greensburg, the citizens of the last-named place having decided to give the firm free ground and a cash bonus of \$50,000 in order to secure the plant. The buildings are brick on stone foundations, and consist of a main building 40 x 228 feet, which is divided into offices, shipping-room and store-rooms. Four large wings extend back

from this building. The outside wing is 690 feet long, 300 feet of which is 60 feet wide; the balance of the wing, 390 feet, is 40 feet wide. This wing is used for the gray-iron foundry and fitting department. The other outside wing is 650 feet long, 200 feet of which is 80 feet wide; the remainder, 450 feet, is 40 feet wide. This wing is devoted to the manufacture of malleable-iron pipe fittings. An inside wing, 440 feet long by 40 wide, is devoted to the brass department. Another inside wing, 200 feet long by 40 feet wide, is called the radiator wing. In this is manufactured steam-heating apparatus, for which this firm have an exceptionally large trade. In addition to these buildings is another in the rear of the main building, two stories in height and fire-proof, 100 feet long by 40 feet wide, used for the making and storage of patterns. These buildings were planned and erected with the idea of reducing to the minimum the cost of manufacturing. Every machine is so placed that it is made to yield the greatest possible results. Many of the machines are ingeniously constructed with reference to labor-saving qualities, quite a number of which were invented by Mr. L. D. Cassell, the general manager of the works. In the foundry a novel system of double track overhead railway for the delivery of the molten iron

### The Silent Grinding Mill.

Fig. 1 of the annexed engravings is a view of one-half of the case and one-half of the ring or wheel within the case; it shows the pockets or scoops for taking up the material and carrying it around and dropping it in front of the wheel, and also shows the ribs upon the inner surfaces of both the ring and case. These ribs, which are designed to crush large pieces of material when inserted at the trunnion and falling within the center of the ring, are shown more fully in Fig. 2, a section of which is broken away to show the pockets discharging the material just in front of the wheel. The case is driven by two friction-wheels having contact with the case at its lowest part. This does away with all noise due to the action of gearing,

being  $3\frac{1}{4}$  inches, thus allowing a down grade of  $\frac{1}{4}$  inch, the water flowing through the larger opening and carrying with it the light matter as fast as ground. When it is desired to retain the material within the mill until sufficiently fine, as in the case of foundry facings, the openings in the trunnions are closed by caps and clamps. The material being put through the openings in the top of the case and the door inserted and held by its clamp, the grinding proceeds until the desired degree of fineness has been reached, when, the door having been removed, a few revolutions will discharge the contents into a box placed underneath the mill. To sift out the material as fast as ground, the door is furnished with a wire cloth through which the ground material passes at each revolution. As the countershaft runs

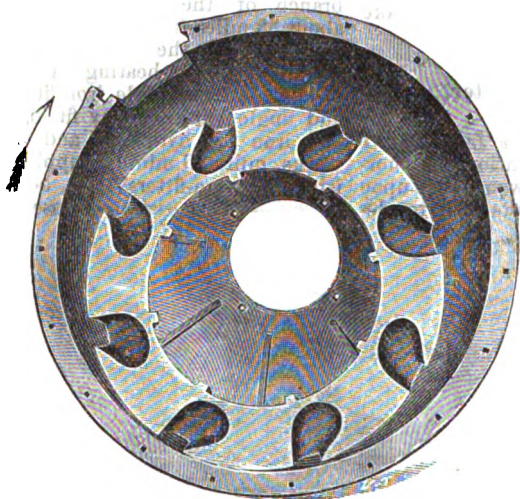


Fig. 1.

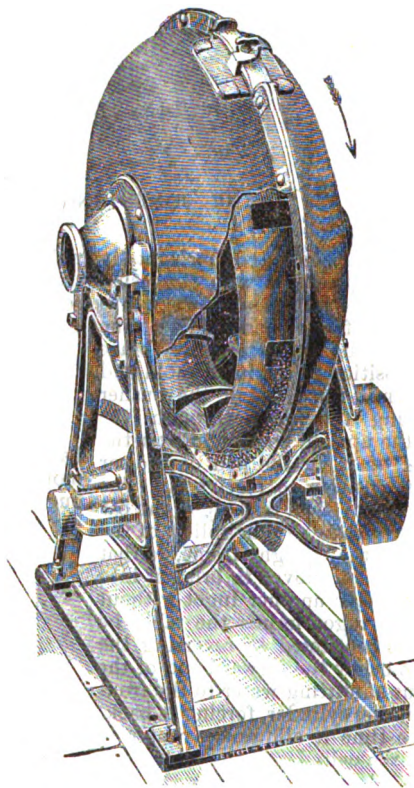


Fig. 2.

### THE SILENT GRINDING MILL, BUILT BY ALBERT M. HILL.

from the cupola to the molders' floor has been introduced and is in successful operation, the empty ladles returning on one side, while the loaded ones pass them coming from the cupola. It is, in short, an endless railway, running parallel. The most perfect devices for the prevention and discovery of fire have been adopted. A watchman is employed who walks through the buildings at stated times. His movements are recorded by a Howard electric watch-clock, which files a record of his movements as he makes his rounds. Automatic water-sprinklers are scattered over the entire building, on all the floors, at a distance of 10 feet from each other, which release a stream of water when the temperature rises to 160° F. When in full operation the works gives employment to about 600 hands, with a pay-roll amounting to over \$5,000 per week. The capital stock of the company is \$300,000, while its officers are as follows: John T. Kelly, of New York, president; James Balph, of Pittsburgh, vice-president; George M. Jones, of Greensburg, treasurer, and Waiter J. Kelly, of Pittsburgh, secretary. The main office is located at the works, while a branch office and warehouse are at 141 and 143 First avenue, Pittsburgh, Pa.

and permits the use of the mill in locations where it could not otherwise be placed. Being driven from below instead of at the center, the power required is small. The heavy ring or wheel, rolling in the case at a speed of about 40 revolutions per minute (when grinding cinders), has great crushing force and grinds rapidly. As the joints are made water-tight by rubber packing, and the hollow trunnions have caps and clamps to hold them when desired, the mill may be used to grind any material, either wet or dry. If it be used for grinding foundry cinders, or skimmings, a branch can be led from the blower-pipe to the opening in the trunnion to blow away the dust as soon as pulverized; this passes out at the other trunnion and can be conducted away through a pipe placed loosely over the outer end of the trunnion. If the dust is objectionable or the works have no blower, the material can be ground wet by leading a pipe to the opening in the trunnion and allowing a stream to flow through, being carried away by a pipe under the outer opening on the opposite side. In this case the openings in the trunnions are of different size, the one in front being  $2\frac{1}{4}$  inches in diameter and the opposite one, out of which the water flows,

continually, the mill is started or stopped by raising or pressing down cam-levers which operate yokes at each side underneath the trunnions, thus lowering or raising the case and bringing it in or out of contact with the sheave. As all the parts of the mill proper are castings requiring no machine work and are interchangeable, any part can be renewed at small cost. This mill is manufactured by Albert M. Hill, of New Haven, Conn.

The steel steamship *Cayuga*, built at the Globe Iron Works, in Cleveland, for the Lehigh Valley Railway Company, was launched on the 2d inst. She cost \$250,000 and measures as follows: Keel, 292 feet 2 inches; over all, 308 feet 8 inches; beam, 40 feet; molded hold, 25 feet 6 inches. Her engine is triple expansion; cylinders, 24, 38 and 61 inches, with a 42-inch stroke. She went into the water with all her machinery aboard of her. Boilers are ready, and she will be ready for sea about the middle of May. The *Cayuga's* carrying capacity is estimated at 2650 net tons on a  $15\frac{1}{4}$ -foot draft, or about 3000 net tons on a  $16\frac{1}{4}$ -foot draft. Her speed is figured at 14 miles per hour.

## MANUFACTURING.

### Iron and Steel.

The employees of the Crane Iron Company, at Catasauqua, Pa., have been notified of a reduction of wages, as follows: Keepers, \$1.90 per day; first helper, \$1.65; second helper, \$1.50; fillers, \$1.50; ironmen, \$1.50; laborers, \$1.10, and all others, 10 per cent.

On Monday, the 1st inst., a notice was posted in the works of the Allentown Rolling Mill Company, at Allentown, Pa., announcing a reduction of wages. The pay of puddlers will be \$3.25 per ton hereafter, a reduction from \$3.60. All other employees, except laborers, will be reduced 10 per cent. The pay of the laborers will remain as at present, \$1 per day.

In answer to a report that the Sheldon Axle Company, of Wilkesbarre, Pa., had decided to increase the size of their plant and take on a number of additional hands, we received the following advices from the company under date of the 6th inst.: "We have not increased our plant or facilities for manufacture in a long time, nor have we increased our output more than the demands usually made upon us at this season of the year require. In our business the time of the greatest demand is during the winter and spring months, and we necessarily are running much heavier during those months than during other parts of the year. Business is fairly good with us; we have faith in a good average year's business."

The Falcon Iron and Nail Company, of Niles, Ohio, started up their nail factory on the 8th inst., for the purpose of working up a small stock of nail plate which they have on hand. When this is done the factory will be closed down again for an indefinite period.

McIlvaue & Sons, of Reading, Pa., have resumed operations in their rolling mill, which has been idle for many weeks.

No. 4 Furnace, of Laughlins & Co., at Pittsburgh, now in course of erection, is rapidly approaching completion, and in all probability will be blown in about the middle of next month. The firm are badly in need of this new furnace. Of their three furnaces only one is in blast. Their No. 1 furnace was torn down about two months ago, while No. 2 was blown out during the latter part of March for relining. No. 3 is the only stack now in blast. This firm are making many extensive improvements, which, when completed, will give them one of the finest furnace plants in the country.

During the month of March there were turned out 2500 tons of steel rails at the Edgar Thomson Steel Works of Carnegie Bros. & Co., Limited, at Braddock, Pa. This is the largest output in any one month in the history of the establishment.

The entire plant of the Bethlehem Iron Company, at Bethlehem, Pa., resumed operations in full on Monday, the 1st inst. The price of puddling was reduced from \$3.80 to \$3.45 per ton.

The Steubenville Iron and Steel Company, of Pittsburgh, capital \$50,000, was chartered on the 3d inst. The stockholders are Joseph R. Jackson and Horace Crosby, of Pittsburgh; James B. Murray, Adolf Crandon and William Iles, of McKeesport, and Henry W. Bishop, of Sewickley.

The Millvale plant of Graff, Bennett & Co., at Pittsburgh, which has been idle since the failure of that firm, about a year ago, was put in operation on Monday, the 8th inst., by a syndicate of creditors represented by James Friend and F. N. Hoffstot. Only a portion of the plant is being operated, but it is the intention of

the syndicate to put the entire plant in operation as soon as possible. The Millvale Iron and Steel Company is the name adopted by the new concern.

A press dispatch from Ashland, Wis., under date of the 5th inst., says: "James E. York, who constructed the blast furnace power in this city, which is the largest of its kind in the world, has made a proposition to the Ashland Business Men's Association for the erection of a structural steel plant to employ 1200 men, and to cost not less than \$1,000,000. Mr. York's terms are that a suitable sum and a bonus of \$100,000 be given to the projectors, who are Eastern capitalists, after a plant such as is proposed shall be in successful operation."

The nail factory of the Bellefonte Iron and Nail Company, at Bellefonte, Pa., was closed down for an indefinite period on the 4th inst., on account of an overstock of nails. The puddling department will continue in operation.

Soho Furnace, of the Moorhead-McCleane Company, at Pittsburgh, produced 5700 tons of Bessemer pig iron last month.

On Monday, the 1st inst., the extensive plant of the Arms Bell Company, Limited, at Youngstown, Ohio, manufacturers of nuts and bolts, was completely destroyed by fire. The loss was \$80,000, partially covered by insurance. The firm write us that they will rebuild the plant as soon as the insurance is adjusted. A small warehouse, an engine-house and carpenter shop belonging to Brown, Bonnell & Co. were also destroyed at the same time, causing a loss of about \$1500, fully covered by insurance.

The nail factory of the Laughlin Nail Company, at Martin's Ferry, Ohio, after an idleness of six weeks, resumed operations in full on Monday, the 1st inst., giving employment to about 500 men.

No. 3 Furnace, of the E. & G. Brooke Iron Company, Limited, at Birdsboro, Pa., will be blown out in a few days for repairs.

The rolling-mill plant of the Stewart Iron Company, Limited, at Sharon, Pa., has been closed down for an indefinite period on account of a lack of orders. The two blast furnaces of the company continue in operation.

Last month the blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, produced 5081 tons of Bessemer pig iron, an average of about 162 tons per day.

The Riverside Iron Works, of Wheeling, W. Va., are in receipt of an order from the Buffalo Gas Light Company, of New York City, for two carloads of steel pipe. This is but a trial lot, and if it proves satisfactory additional shipments will be made.

The Central Iron and Steel Company, of Brazil, Ind., are erecting a small addition to their plant for the manufacture of railroad spikes. It will soon be ready for operation.

On Tuesday, the 2d inst., work was commenced on the new plant of the Union Drawn Steel Company, to be located at Beaver Falls, Pa. The works will be built at the lower end of Seventh avenue, on the site of the old car works. The company have bought the entire square from Sixth to Seventh avenue fronting the cutlery works, and also 30 shares of water power which will furnish them motive power. They will manufacture cold-drawn steel, iron and other metals by patented processes and machinery fully controlled by them. The capital stock is \$100,000, a large portion of it being held by Pittsburgh parties. The building will be 50 x 200 feet, one and a half stories high and iron clad. The following offi-

cers have been elected: President, H. W. Hartman, Beaver Falls; vice-president, F. H. Adriance, Poughkeepsie, N. Y.; secretary and treasurer, William Anderson, Beaver Falls; superintendent, W. A. McCool. The works will be in operation in early June.

The blast furnace of the Belmont Neil Company, at Wheeling, W. Va., produced 3400 tons of Bessemer pig iron during the month of March just closed.

M. V. Smith, metallurgical engineer, of Pittsburgh, has just completed a contract for three of his improved regenerative gas furnaces and four gas producers for the Beaver Falls Mills, of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa., making six regenerative gas furnaces and seven artificial gas producers in these works.

The Leechburg Foundry and Machine Company, of Pittsburgh, whose works are located at Leechburg, Pa., have received an order from the Troy Steel and Iron Company, of Troy, N. Y., to furnish them with ingot molds for their Bessemer-steel plant. They have also received a large order from the Reading Nut and Bolt Company, of Reading, Pa., for rolls.

At the new rail mill of the Allegheny Bessemer Steel Company, at Duquesne, Pa., there were recently rolled in 12½ minutes, 65 rails, each of which was 30 feet long. This plant is now running double turn in every department.

The Norway Steel and Iron Works, at South Boston, Mass., were purchased by J. B. Kendall on March 25 for about \$125,000. The company who have owned these works were formed many years ago by Sebastian B. and Barthold Schlesinger. The plant has cost the company over \$1,250,000, and consists of a tract of land on Dorchester avenue of about 6 acres, with machinery and mills. The works have been unprofitable for some years. The company will be dissolved on May 1.

The entire plant of the Columbia Iron Company, at Columbia, Pa., was closed down on the 6th inst. for an indefinite period on account of the present depression in the iron market.

### Machinery.

Last week the Union Switch and Signal Company, of Pittsburgh, shipped 72 lever machines to Jersey City, to be used at the terminus of the Jersey Central Railroad.

On Friday, the 5th inst., the machinery warehouse of J. B. Sheriff, Son & Co., on Water street, Pittsburgh, was completely destroyed by fire. The loss has been estimated at \$35,000, fully covered by insurance. The firm have arranged to secure another warehouse, and will continue their business without interruption.

The Union Boiler Company, of Reading, Pa., have been dissolved, and the business will hereafter be conducted in Reading by F. J. Obert, Sr. The business of the company in Lebanon, Pa., will be conducted by Mr. Obert and Jacob H. Grove.

The Standard Oil Company have commenced work on their new boiler works, to be located at Lima, Ohio. It will be utilized in manufacturing new boilers, making plates for iron tanks and repairing old boilers. The company now own 400 or 500 boilers in the field which they acquired in the purchase of leases from the producers. A large cooper shop and paraffine works will also be put up as soon as the other works are completed.

The Rensselaer Mfg. Company, of Troy, N. Y., makers of the well-known straight-way valves, are about occupying their new premises in Cohoes, N. Y. The new works comprise a machine shop, of two stories in height, with a 9-foot basement, and are 175 feet long by 43 feet wide. In



the south end of this shop the business offices of the works are located. The foundry beneath, part of which is a cellar, is 160 x 50 feet wide. Between the foundry and machine shop is a one-story boiler-house 35 x 40 feet and a cupola-house 18 x 20 feet. The tumbling mills are in a building 44 x 12 feet. The machinery will be operated by an 80 horse-power Corliss engine, supplied with steam from a 100 horse-power boiler. The buildings are of brick and stone. The coal and iron will be supplied to the cupola by a steam elevator; another steam elevator is in the machine shop. A side track will be on the west side of the works, the railroad frontage being about 450 feet, while the river frontage is about the same as the works are on Van Shaick's Island. There will be about 200 men employed in the manufacture of straightway valves for water, gas and steam, besides a variety of scales and brass castings. The business of this company has largely increased of late, and they have been obliged to erect these new works or enlarge their old ones. Ransom & Co., 94 and 96 Center street, are the agents of the company in New York City.

Bryam & Co., Detroit, Mich., manufacturers of the Colliau cupola, received in one day's mail of this week orders for five Colliau cupolas from different parts of the country.

The Ball Engine Company, of Erie, Pa., have received from the Edison Electric Illuminating Company, of Brooklyn, an order for twelve 300 horse-power compound engines. With one exception, this is said to be the largest order ever given in this country for compound engines, and it will take about a year to fill it. The output of these shops for February was 18 engines, aggregating 1570 horse-power, divided as follows: Three 150 horse-power; four 100 horse-power; six, 80; three, 60; one of 35 and one of 25. It is expected that this summer will be one of the busiest the concern has ever seen.

The Cady Mfg. Company, of Cleveland, have recently incorporated and elected as officers R. C. Moody, president; Frank P. Cady, vice-president, and Irving A. Brown, secretary and treasurer. They will engage in the manufacture of machinery and will make a specialty of machines for the working of wire into all its forms.

The largest amount of agricultural machinery ever shipped to the Pacific Coast in one lot was shipped by Russell & Co., manufacturers of agricultural machinery, located at Massillon, Ohio, on Monday, the 8th inst. The shipment comprised 46 threshing machines, 24 horse-powers and 32 traction engines, and will require an entire train to transport it. The aggregate value of the shipment is upward of \$80,000, and it is probably the largest single shipment of threshing machines and engines ever made. The freight charges on the shipment will amount to about \$8000. With the exception of one other case, where a train of 17 cars was loaded to one consignee on the Pacific Coast, this, it is believed, is the only attempt to run a solid train of machinery through to that territory.

Under date of the 5th inst., the Lloyd Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, write us as follows: "We shipped last month to the New Albany Forge and Rolling Mill Company, New Albany, Ind., one complete 10-inch guide train, and to the Knoxville Iron Company, of Knoxville, Tenn., one rotary squeezer. We have also just completed for the Minnesota Car Company, Duluth, Minn., one 18-inch bar mill, including the extra rolls for same, one No. 1 lever shear and five cranes, and have now under way for Chicago mills the following: One each

10-inch, 12-inch and 18-inch roll trains including the extra rolls for same; two of our No. 1, two No. 3, one No. 4 and one No. 5 lever shears, all with engines attached, four busheling furnaces, one rotary squeezer, one roll lathe, &c. Local business is about as usual, but inquiries are not as plenty as they should be at this time of year for new work."

#### Hardware.

The large works of the Nimick & Brittan Mfg. Company, of Pittsburgh, which are located at Lockton station, about 6 miles from that city, have been closed down indefinitely on account of a lack of orders. The firm are large manufacturers of builders' hardware.

The extensive axe, shovel and saw factories of Hubbard & Co., in Pittsburgh, were totally burned 7th inst. The two main buildings were each 320 x 60 feet long, and the other two buildings were formed as an L, each being about 250 feet long. Only a small section of the office was left standing. It is stated that the loss on the buildings, machinery and stock will be more than \$250,000, which is nearly covered by insurance. The firm employed 360 men, who will be thrown out of employment for a time, it being the intention of the firm to rebuild immediately. The large plant of the firm at Beaver Falls will also close down, as the stock for the axe factory at that place was furnished from the works in Pittsburgh.

It is reported that a syndicate of capitalists of Pittsburgh and Wheeling are contemplating the erection of a large plant to be located at Greensburg, Pa., for the manufacture of steel wire nails, and that plans for the construction of the plant have been drawn up.

The Anthony Wayne Mfg. Company, Fort Wayne, Ind., write under date of 5th inst. as follows: "Last month has been the greatest ever experienced in our business, we having sold over 2000 machines during the month and had to increase our force of workmen so as to enable us to produce 80 machines per day. Orders keep coming in about the same this month, and we are now adding more machinery, and will be able in a short time to make 100 per day. We are still considerably behind our orders, but with the increased facilities we will soon catch up, and the prospect for a splendid trade on our new No. 3 is very encouraging."

#### Miscellaneous.

Carnegie Bros. & Co., Limited, of Pittsburgh, have purchased an interest in the Wallingford manganese mines, owned by Bradley & Lyons, situated in the town of Wallingford, Vt. The Carnegies are to pay \$10,000, and the former owners reserve a half interest in future profits. The Carnegies will put in \$25,000 worth of new machinery and largely increase the force of workmen now employed.

For some time past the old-established Troy Fire Brick Works, Troy, N. Y., have been busily engaged in making extensive improvements, and have added to what was regarded as a model plant a system of tunnel driers and railroad tracks. The driers, in combination with the old system of drying, which is still in operation, increase the capacity of these works to over 10,000,000 fire brick per year. These works are being run constantly and their product is shipped throughout the United States, Canada and South America.

American tourists who have "done" the Old World to satiety are now going through Mexico in large numbers. The capital has a population of about 500,000, of whom probably not more than 50,000 are whites.

## THE WEEK.

The Harlem River Bridge at 185th street is a costly structure. The original contract was \$2,055,000, but the bills now foot up \$2,648,784.

Duluth will be enlarged during the year 1889 by the construction of buildings which will cost upward of \$2,000,000. Among the number are the Chamber of Commerce, Masonic Temple and Union Railroad Depot. The city will soon have 50,000 inhabitants.

English papers describe several successful trials of smokeless powder. After heavy firing there was only a faint mist. Hereafter battles may be prolonged with unaccustomed fury and pertinacity.

Visitors to the Paris Exposition crowd the steamers sailing for Europe.

The new Secretary of the Navy is said to be a hard worker. He is already familiar with the duties of the office.

The new Collector of the Port of New York is Joel B. Erhardt, recently a candidate for Mayor, and Cornelius Van Cott succeeds Postmaster Pearson.

One hundred refrigerator cars have been built expressly for the Atlantic Coast all-rail route and have made their first trip, arriving from Florida about two days quicker than by the water route, while the freight charges are the same. The ice in the cars is all placed near the top, so that the cold air, on account of its natural tendency to descend, will be about uniform in temperature throughout the entire trip. A special system of ventilation has also been introduced.

The valuable phosphate lands near Charleston, S. C., are being bought up by New York capitalists at from \$200 to \$300 per acre.

An extraordinary case of alleged smuggling and fraud on the Custom House was developed during the week, in which the large Parisian firm of Allard & Son, on Fifth avenue, in this city, are implicated. Blossaire, a former subordinate of the house, voluntarily communicated with one of the United States special agents information which led to the seizure of the Fifth avenue establishment, wherein was found a large quantity of upholstered furniture stuffed with tapestries, silks, laces, bronzes, &c. The scheme pursued by the firm, it is alleged, was to consign to their New York house cabinet furniture in which were concealed, underneath the marble tops and in the false paneling, costly portière curtains and rich Gobelin tapestries. Customs duties, of course, would be paid only on the furniture. In the Fifth avenue store the smuggled goods would be removed. Purchasers were charged extravagant prices for the articles, with the duties added thereto. Thus a double fraud was perpetrated. It is not suspected that any one of the many purchasers had the remotest idea that the goods were smuggled, but it is surmised that they will have the alternative presented of paying the duties or forfeiting the goods.

Fire Marshal Lewis, of Brooklyn, has captured several alleged anarchists, of whom Bernard Naumann is the supposed leader, who are charged with numerous acts of incendiarism, with the object of obtaining the insurance. Thus far they have succeeded in obtaining \$15,000 from the various companies.

Property owners who are interested in real estate in this city lying contiguous to the proposed termini of the North and East River bridges vigorously oppose the bills authorizing their construction. The former, it is claimed, would prove injuri-



ous to navigation, especially if it should have a central pier. Besides, its approaches might extend to Union Square. The East River Bridge would, it is said, convert Fourth avenue into a thoroughfare for railroad traffic. It can hardly be assumed that arguments of this character would apply equally to all kindred enterprises and to all locations.

San Domingo, which lately favored the Northern party in the Haytian struggle, has suddenly declared in favor of Legitime, who at once succeeded in borrowing \$600,000 from merchants in Port au Prince on the strength of this recognition. The defection of San Domingo is the hardest blow Hippolyte has received.

William J. Lyons, who died in this city last week, for more than a quarter of a century was a member of the firm of Blunt & Lyons, who were among the largest gun-makers and dealers in New York City.

Montreal advices from England respecting the cattle trade indicate a marked depression, the supplies being excessive in all markets and the outlook for Canadian shippers was discouraging.

All the shipbuilders along the Delaware River have had to increase their working force materially within the last half-year, so that now fully twice as many men are employed in the various shipyards as there were a year ago. Not only have Government contracts kept the firms busy, but there have been many orders for merchant ships for private enterprises. The Wilmington yards and the smaller companies near Philadelphia have had a like extension of business, and have employed a proportionate number of new men.

New Orleans will derive an important advantage from the completion of the work of connecting the Mexican Gulf canal with the Mississippi River by a system of locks, affording a new interior route. With a safe water route established between New Orleans and the Alabama coal fields, for barge navigation, Southern coal should be delivered in New Orleans in bulk at rates of transportation as cheap as those of the water-route between that port and the coal mines of Pennsylvania.

Better prices for sugar have given a new impulse to the sugar industry in Louisiana, and planters are ordering improved machinery, otherwise known as diffusion apparatus. New Orleans foundries claim that they can construct all the machinery needed in the sugar region, whether diffusion batteries, double mills, double effects or vacuum pans.

The People's Line steamer Dean Richmond has been equipped with new steel boilers and the Day Line steamer Albany has a surface condenser.

St. Paul papers describe the plans of a new opera-house to be built in that city at a cost of \$1,000,000.

The railway system in the British island of Jamaica has been sold to an American syndicate. The line comprises about 93 miles, running from Kingston to Spanish Town and Old Harbor, and another line from Kingston to Porous. The syndicate have also acquired the right of building what is practically a belt line around the island, and will export largely of native products.

The new Inman ship the City of Paris promises to be the greyhound of the Atlantic fleet this summer. The official report of her trial trip says that she made 20 knots an hour.

The new courthouse just completed at St. Paul, Minn., takes rank among the most imposing architectural piles in the West. The several contracts for construction amounted to \$877,000. The walls are

of stone, and the iron roofing was put on by the Hugh Ketchum Iron Works, of Indianapolis, for \$79,724.06. The plumbing contract, amounting to \$9600, was secured by J. P. Dawson, of St. Paul.

The proposed stairways, porticoes, towers and approaches to the new Capitol building at Albany will cost \$2,700,000 if completed in accordance with the plans now exhibited.

The Philadelphia and Reading Railroad have decided, it is reported, to sell several million dollars' worth of their property, in order to pay off some of their mortgages, and so reduce fixed charges. Among the properties to be disposed of are their rolling mill, including 43 dwellings and 51 acres at Reading, the rolling mill at Hamburg, the Mansion House at Mount Carbon and a large amount of improved farm lands.

The South Boston Iron Works are pushing the work on the 6-inch rifles for the Government. The first gun will be ready for shipment to the proving ground by the middle of next month, and from that date on one gun will be completed each succeeding month. The forgings and material for the guns are being made by the Midvale Steel Company, the work having been given them direct from the Navy Department. These works and the West Point Foundry each have contracts for six guns. The South Boston Iron Works have now at Sandy Hook two 12-inch breech-loading guns for trial. If the next 12-inch gun proves successful the company expect a contract of from 50 to 100 guns of the same type.

Three prominent Knights of Labor in this city are in difficulty, having been indicted by the grand jury under a charge of attempting to dynamite Stevenson's brewery about two months ago. They are John O'Connell, Thomas Reardon and Patrick S. Close, members of the Executive Committee of the Ale and Porter Employees' Protective Association. The principal witness is an informer named Henry A. Fitzgerald, who claims to have been until lately a Knight of Labor, and also boasts that, as a walking delegate, it was he who first urged the boycott against Stevenson's brewery.

The American Silk Manufacturers' Association propose to establish a weaving school, and a committee has been appointed to mature a plan. The manufacturers state that all the weavers employed in this country are foreigners, and that although the young men who learn the trade here are among the best in the mills, Americans are practically shut out from the industry. Young men here can earn from \$1200 to \$1500 a year.

Major Joseph J. McDowell, a prominent iron broker of St. Louis, died suddenly 6th inst., soon after leaving 'Change. On coming to St. Louis after the close of the war he entered the iron business with the firm of Garrett, McDowell & Co. Later the firm dissolved, and has since been J. J. McDowell & Co.

Secretary Tracy's inspection of League Island last week revealed little besides an array of dilapidated buildings ill-suited to the equipment of a modern navy yard. The iron-plating shop, which is a brick building and in good condition, it is proposed to turn into an iron foundry, which can be done at comparatively small cost. The old steam engineering building, which under the new conditions would be too small for the purpose, it is proposed to use as a storehouse. The present yards and docks building, which is also brick and in fairly good condition, will be retained. The most important new buildings proposed are those of the Steam Engineering and the Navigation, Ordnance and Equip-

ment bureaus. The cost of erecting the two latter buildings and making the proposed changes in the three brick buildings already standing is estimated at \$1,888,000.

The traffic of the Canadian Northwest seems to be gravitating toward Duluth as a direct result of the various extensions of the Northern Pacific Railroad now in progress under specific acts of the Manitoba Legislature, as well as an act of the Parliament at Ottawa. Duluth, therefore, it is proclaimed, "is to become the lake outlet for the great and growing Canadian Northwest." The Duluth Herald says: "The Northern Pacific, whose transcontinental line from Duluth to Tacoma is the main competitor on through traffic with the Canadian Pacific, will at once be an active competitor for the local business of the great and fertile valleys of the Assiniboine, the Saskatchewan and the lower Peace rivers. It is no secret that the Grand Trunk is behind the Northern Pacific in both these extensions and others, and the two roads will work together in competition with the Canadian Pacific."

The New York Chamber of Commerce suggests that a business man should be appointed to the vacancy on the Interstate Commerce Commission.

The Anchor Line Steamship Company have taken possession of their recent purchase on the water front in Brooklyn, comprising the Kelsey stores and Union stores and three long piers. The cost of the property is \$500,000.

Stanley and Emin Pacha are said to be in possession of 3,000,000 francs' worth of ivory, with which they are approaching Zanzibar.

The new building for the Manufacturers' Club, in Philadelphia, has been completed at a cost of \$250,000. The interior woodwork and decorations are of an elegant description and the electric heating and sanitary arrangements are believed to equal anything in the United States. The front is entered by a broad arched doorway, with an elegant stairway of oak fully in view, and is peculiar from having a three-deck balcony of heavy stone.

Florida orange growers say the next season's crop will be doubled and they begin to fear that the market will be surfeited.

The largest taxpayer in Germany is Herr Krupp, the Essen gun-maker, who pays £6480, on an income of £219,000; and next comes Baron Willy de Rothschild, of Frankfurt-on-Main, with an income of £205,000 and a tax of £5940. The greatest income returned by a resident in Berlin is £123,000. There are three others whose incomes vary from £48,000 to £57,000, and there are six more who have upward of £30,000 a year each. There are also 166 persons in Berlin whose incomes are between £6000 and £10,000.

There were 45 ocean vessels in Puget Sound at the opening of the season.

The depreciation in the value of Western stocks, which has occurred within the last 12 months, fully accounts for the depression in some departments of speculative trade, of which so much is said. One of the commercial writers for the daily press makes the following record, to show the shrinkage in value from the highest prices in 1888 to the prices now current:

Atchison.....	\$44,250,000
Chicago and Alton.....	1,411,000
Burlington and Quincy.....	30,400,000
St. Paul, common.....	6,400,000
St. Paul, preferred.....	3,570,000
Northwest, common.....	5,300,000
Northwest, preferred.....	2,500,000
Rock Island.....	11,000,000
Missouri Pacific.....	11,250,000
Union Pacific.....	5,400,000
Total.....	\$121,481,000

# The Iron Age

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## The Freight Agitation.

The agitation among iron producers over irregularities in the freight rates in different parts of the country is spreading. It is true that vigorous protests have been made for some time by the producers of some sections, a notable instance being the work done by the Mahoning Valley Iron Manufacturers' Association. But at no time has the question so profoundly stirred so wide a territory. Producers in Ohio, Eastern and Western Pennsylvania, New Jersey and New York are thoroughly aroused. From every quarter come complaints of serious discrimination, backed by facts which the railroad managers cannot afford to ignore. The principal impulse, so far as the pig iron manufacturers of the East and some in the West are concerned, has come from the sharp competition of the Southern makers. But a study of the subject has revealed many irregularities in other directions, aside from the contest between the rail-makers of Pittsburgh and Chicago.

Taking up first the question of Southern rates of freight for long distances, official data enable us to compile the following table, the rates to points north of the Ohio and west of the Mississippi River being made on the basis of the Southern rates to Ohio and Mississippi River points plus the arbitraries from those points, which are fixed by the lines north and west thereof:

### Southern Rates on Pig Iron from Birmingham, Ala.

To	Distance. Miles.	Rate 2268 pounds.	Per ton per mile. Cents.
Cincinnati.....	478	\$3.75	0.55
Louisville.....	394	2.50	.62
Evansville.....	364	2.75	.74
Cairo.....	359	2.75	.76
Memphis.....	251	2.00	.79

### From Chattanooga, Tenn.

Cincinnati.....	335	\$2.25	.69
Louisville.....	311	2.25	.72
Evansville.....	306	2.50	.81
Cairo.....	347	2.50	.72
Memphis.....	310	2.00	.60

On finished iron we have the following rates:

### Southern Rates on Manufactured Iron from Birmingham.

To	Distance. Miles.	Rate 100 pounds.	Per gross ton per mile. Cent.
Cincinnati.....	478	\$0.12	0.56
Louisville.....	394	.11	.62
Evansville.....	364	.12	.73
Cairo.....	359	.12	.75
Memphis.....	251	.09	.80

### From Chattanooga.

Cincinnati.....	335	.10	.67
Louisville.....	311	.10	.72
Evansville.....	306	.11	.80
Cairo.....	347	.11	.71
Memphis.....	310	.09	.65

Of course it must be considered that the Cincinnati and Louisville rates are the most important, since the quantities shipped to those points are the greatest.

Let us compare these figures with those of Western Pennsylvania and the Mahoning Valley:

### Rates on Pig Iron, Western Pennsylvania and Ohio.

Distance. Miles.	Rate. Gross ton.	Per ton per mile. Cents.
5.....	\$0.247	4.94
6.....	.247	4.12
9.....	.247	2.74
15.....	.48	3.20
41.....	.80	1.95
49.....	.80	1.63
58.....	.94	1.62
68.....	.79	1.16
70.....	.80	1.14
74.....	.79	1.07
76.....	.80	1.06
80.....	.80	1.00
487.....	2.20	0.47

Some rates on materials are as under:

### Rates on Raw Materials.

Distance. Miles.	Iron Ore. Rate. Gross ton.	Per ton per mile. Cents.
58.....	\$0.725	1.25
121.....	1.10	.90
137.....	1.20	.87
148.....	1.20	.84
180.....	1.00	.56
193.....	1.60	.83
Mill Cinder.		
45.....	.50	1.11
49.....	.70	1.43
60.....	.70	1.17
74.....	.70	0.95
103.....	1.02	1.00
Coke.		
75.....	1.00	1.33
127.....	1.51	1.19
Limestone.		
16.....	.35	2.19
18.....	.30	1.67
118.....	.80	0.67
124.....	.80	0.64
148.....	.85	0.57
Muck Bar.		
40.....	.91	2.27
172.....	2.24	1.30
202.....	2.89	1.10
Steel Billets.		
157.....	2.91	1.85
180.....	1.68	1.05
172.....	2.24	1.30

So far as pig iron is concerned the hauls are all relatively short, while the data on long distances show rates as low as those of Southern makers. On the whole producers do not complain of the rates paid on transportation less than 25 miles, but from that distance upward to 100 miles the charges are relatively exorbitant and should certainly be reduced 25 per cent.

On materials the most outrageous rates on hauls of moderate distances are those on coke. Our figure for the distance of 127 miles practically covers the Mahoning and Shenango Valley districts.

A manufacturer of Bessemer pig in the Shenango Valley sends us data which enable us to tabulate the freight cost per ton of product as follows:

Material	Lake ore.	Coke.	Lime- stone.
Distance.....	80	127	18
Freight per ton.....	\$0.724	\$1.51	\$0.30
Freight per ton per mile.....	0.904	1.194	1.674
Quantity per ton of iron.....	1.6	1.25	0.5
Freight cost per ton of iron.....	\$1.16	\$1.89	\$0.15

This makes a total of \$3. Now, if the rate per mile were reduced to 0.65 cent on ore and coke and that on limestone to 1.5 cents, the total freight cost would be reduced to \$2. The haul to the principal market—Pittsburgh—a distance of 70 miles, is now 80 cents, or 1.14 cents per ton per mile. At 0.75 cent per mile there would be a reduction in this item of 28 cents.

A striking instance of the payments for freight as an item of cost of manufacturing pig iron is cited by an Eastern furnaceman. The consumption of raw material per ton of product is 4.175 gross tons. Although one-half of the ore is hauled only a distance of eight miles, and

the balance less than 25 miles, although the haul on the limestone is only eight miles, and the anthracite coal comes a distance of 100 miles, the freight cost is over \$3 per ton.

No clearer statement of the grievances of the manufacturers of the Mahoning Valley can be presented than the following letter from J. H. Sheadle, secretary of the Mahoning Valley Iron Manufacturers' Association:

The question of high freight rates is becoming a serious matter with us, and the disposition of *The Iron Age* to open its columns to a discussion of freight rates is a matter for much congratulation on the part of the ironmasters of the Mahoning Valley. Adopting the term used by Andrew Carnegie when expressing a condition of the iron business of the State of Pennsylvania, "We are at the mercy of the railroads." With our markets constantly shifting, and some of our more natural markets slipping away from us, perhaps never to be regained, the conditions that confront us are full of the greatest moment. It is not the purpose of the writer to more than present a few facts, for these facts are far more expressive than words. Some idea of the disadvantage under which this section labors by reason of the high and unequal tariffs maintained by the railroads may be gleaned from the following data: In the matter of coke rates, the present tariff on this commodity from the ovens to Chicago, a distance of 528 miles, is \$2.75 per ton, or 0.52 cent per ton per mile, while the rate to the furnaces in the Mahoning Valley is \$1.35 per ton for a distance of 130 miles, or 1.04 cents per ton per mile.

The rate on ore from the lakes to the valley furnaces, a distance of 67 miles, is 72½ cents, or 1.07 cents per ton per mile, while the railroads haul this freight from the lakes to the Hocking Valley, a distance of, say, 170 miles, for 85 cents per ton, or 0.50 cent per ton per mile. Coal is another commodity in which we are greatly discriminated against in the matter of freight. The rates on coal to all points from the Pittsburgh district are made from Pittsburgh as the center of a 40-mile radius. The rate from this district to the valley, a distance of 65 miles, is 70 cents per ton, or 1.08 cents per ton per mile. The discrimination here lies in the fact that this coal is hauled over the same tracks through this valley to Cleveland, a total distance of, say, 132 miles, for 90 cents per ton, or 0.68 cent per ton per mile. In other words, coal is hauled from Youngstown to Cleveland, 67 miles, for 20 cents per ton additional to the rate paid on coal destined for Youngstown. These are some of the differences in freight charges on material entering into the manufacture of iron. Now, let us make some comparisons of pig iron tariffs.

The rate charged by Southern roads on pig iron from Birmingham to Cincinnati, a distance of 478 miles, is \$2.75 per ton, or 0.57 cent per ton per mile, while from Youngstown to Philadelphia via Pennsylvania lines, a distance of 419 miles, the rate is \$2.70, or 0.69 cent per ton per mile. Taking a short haul—for example, from Birmingham to Atlanta, a distance of 168 miles—the rate is \$1.35 per ton, or 0.82 cent per ton per mile, while the rate from Youngstown to Marion, Ohio, a distance of 156 miles, is \$1.40 per ton, or 0.90 cent per ton per mile.

Another flagrant case of discrimination may be found in the following comparison: The rate from Albany to Chicago is

\$2.80 per ton for a distance of 840 miles, or 0.33 cent per ton per mile, while the rate from Youngstown to Boston, a distance of 690 miles, is \$4.30 per ton, or 0.64 cent per ton per mile. The writer could go on indefinitely making comparisons such as above, but these will suffice. As a result of the lack of foresight manifested by the railroads in this section by placing upon our traffic "all that it will stand," the large amount of pig iron formerly going to Chicago and the West by the train load has been cut off almost entirely, indeed, amounting so far in 1889 to but six-tenths of 1 per cent. of our output. The same forces are at work in manufactured iron.

Since the advance in freight rates of the first of this year the percentage of manufactured iron heretofore shipped into the West and Northwest from this Valley has been reduced one-half. The mills receive inquiries from these sections, but too frequently the buyer replies "your prices are satisfactory, but the rate of freight precludes acceptance of your quotations." It behooves the railroads to look into the future further than across the width of a freight bill and not continue the present burdensome tariffs until such time as it is everlastingly too late.

Mr. Andrew Carnegie has voiced Pittsburgh interests in a letter to the Pittsburgh *Dispatch* which we print below:

To bring the matter distinctly before the citizens of Pittsburgh I make the following statement:

1. The Pennsylvania Railroad Company bring a train load of coke from Connellsville mines to the city of Pittsburgh; the cars belong to the shipper and are loaded and unloaded by him. The Pennsylvania Railroad Company only haul the cars; the engines and crews that haul them stop at Pittsburgh. Upon this coke if destined for Chicago furnaces the Pennsylvania Railroad Company's share is 30 cents per ton. Should the coke be destined for Pittsburgh furnaces the Pennsylvania Railroad Company charge 70 cents per ton. In both cases the Pennsylvania Railroad Company have performed exactly the same service. There is no question of longer or shorter haul or terminals. If any man can show that a train load of such coke coming from Connellsville to Pittsburgh destined for Pittsburgh costs the Pennsylvania Railroad 1 cent more than a train load of coke destined for Chicago for the service performed to Pittsburgh, let him do so.

2. A train load of ironstone is carried to Hocking Valley furnaces from the lakes, a distance of 175 miles, for 85 cents per ton. If a train of similar ironstone is brought from the lakes to Pittsburgh, a distance of 150 miles, the charge is \$1.25 per ton. These two overcharges sum up as follows per ton of iron:

One ton of coke required per ton of iron, overcharge to Pittsburgh, as against Chicago	\$0.40
One and six-tenths tons of ironstone required to make 1 ton of Bessemer pig iron, overcharge to Pittsburgh, as compared with Hocking Valley furnaces...	.72

\$1.12

The amount extorted by the Pennsylvania Railroad Company upon Pittsburgh traffic over and above what is charged to furnaces beyond the State being thus \$1.12 per ton of iron.

The rate charged by the Baltimore and Ohio Railroad Company upon ironstone from lakes to the Hocking Valley furnaces is now the usual rate upon ironstone. The railroads centering in Chicago carry it from Lake Superior mines at the same

rate per ton per mile—viz.,  $\frac{1}{2}$  cent. The distance to the Chicago turnarounds from the Superior mines is greater than from the lakes to Pittsburgh, but the railroad companies take back the cars empty from Chicago, while from Pittsburgh the railroad company gets loading back with coal.

I give only these two instances to prove my statement that every ton of pig iron manufactured in the Pittsburgh district is overcharged by the Pennsylvania Railroad monopoly \$1 per ton. Upon every ton of finished iron shipped East or West from Pittsburgh (except rails) is overcharged from 50 cents to \$1 per ton. It is by such means the Pennsylvania Railroad have built up their surplus fund to \$19,000,000, and extracted from the State of Pennsylvania last year \$4,000,000 more than their interest and dividend. If Pittsburgh stands this it will stand anything. I do not believe it will stand it long. Indeed, it cannot stand it long.

*The Iron Age* is not the champion of any one section as against any other. Justice to all and a fair opportunity to every district is what must be contended for. We believe, however, that we have shown that great injustice is being done in one way or another to the majority of producers north of the Ohio and the Potomac. We believe that the data we have already presented have proved that for hauls over moderate distances, say between 50 and 150 miles, the rates paid are at least 25 per cent. too high. They must come down, and come down quickly, too. A similar state of affairs exists so far as rates on manufactured iron are concerned, with which we shall deal in a future issue.

#### The Sliding Scale for Wages.

In his speech to the workmen, at Brad-dock, on the 30th ult., Mr. Andrew Carnegie referred in terms of the strongest commendation to the sliding scale system of paying wages which is now used in a number of the industrial enterprises with which he is connected. His words of praise for the system, strong as they were, are entirely warranted, not only by his experience, but by that of others who have succeeded in inducing their workmen to accept it. The foremost practical advocate of the system in the iron trade for years has been Mr. O. W. Potter, of the North Chicago Rolling Mill Company, who has, with a steadfast persistence born of faith in its perfect equity toward all interests involved, endeavored to secure its adoption throughout his entire works. In this he has been measurably successful, his largest plant being operated in this way exclusively. Fifteen years since Mr. Potter had introduced a sliding scale which promised to work most satisfactorily, when the agreement was annulled by the wave of sentiment for national organization which swept through the ranks of ironworkers everywhere. Few mills were able for a long time afterward to make separate arrangements with their working force which involved a radical departure from the scheme of national organization. In 1885, however, Mr. Potter succeeded in convincing his employees that the method of establishing a fixed basis of wages once a year for the ensuing twelve-months was not productive of as good results for them or him as a sliding scale which would change from month to month

as prices fluctuated. As soon as prices advanced, he argued, wages also should advance, while in case of a decline it was only fair that all should participate in the lessening of profits, the workmen as well as the mill owner. Costly strikes, too, through which the workmen had gone, in their endeavor to regulate their own wages, had set them to thinking.

The agreement which was made for the South Chicago works of the North Chicago Rolling Mill Company in 1885, based on the selling price of rails, is in force to-day with some slight modifications rendered necessary by the lapse of time. At first only the workmen in the rail and steel departments were covered, but now the furnacemen and other employees are included, and the system may be said to have been perfected at these works. The agreement, which was signed by the officers of the company and a committee representing the men, was exhaustive, covering the arrangement of the scale on a proper basis, the time of advance notice to be given should either party desire to abandon the system, the method of fixing the price of rails to govern the wages for each month, and the selection of an arbitration committee to pass upon any disputed point, whose decision should be final upon both parties. The error was not committed of establishing a minimum rate below which wages should not diminish, but the scale was continued low enough to cover the lowest possible point of depression in price, while it was carried high enough to embrace "boom" rates. The sheets devoted to this scale and setting forth the exact wages of each class of workmen at each change in the price of rails are very large, and demonstrate the intricacy of the problem which in this case has been so happily solved for both men and employers. No annual period of strife and contention over wages is now looked forward to, no danger of a strike or other labor trouble now looms up to interfere with a contract, but the men eagerly anticipate an advance in the price of rails and an improvement in trade, because they will at once reap the benefit of it when the mill begins to roll the dearer rails.

The question may be asked, Who fixes the price each month on which the wages are to be based for that month? The workmen themselves have a share in this. Whenever rolls are changed the foreman of the rail mill posts up the name of the railroad whose rails will next be rolled. The workmen are thus posted on their work from day to day, or, if running on small orders, every few hours. At the end of the month a committee of the men is given access to the contracts for the rails which they knew to be rolled, and any other help is furnished which may be needed to aid them in securing full information as to the prices received. If special time on rails is to be given, that is taken into account and the interest deducted from the price. The point aimed at is to get the actual net rate realized at the mill on the rails rolled during the month. When that is settled the rest is easy. The schedules are made up for the several classes of men, and they are paid off at the rates fixed in the agreement.

It would seem to be not an insurmountable task to arrange a sliding scale to suit the products of almost any mill if both

the employers and their workmen could agree to adopt that system. But a fatal objection to it in some parts of the country would undoubtedly be the segregation of the workmen of each mill. As no two mills are precisely alike, no uniform scale could be adopted that would be applicable to an entire district, and organized labor would oppose any step which would tend to individualize the mills. In doing what he has done at South Chicago Mr. Potter has not antagonized trades unions, but, on the contrary, he has recognized them as far as he could in carrying the sliding scale system into effect. A committee of workmen is treated with as representing the men collectively, and they are not treated individually. In fact, at his Bay View mill, where bar iron and nails are manufactured, the rules of the Amalgamated Association are enforced and that organization's scale of wages is paid. It would certainly be more just to all parties if a sliding scale should be adopted there also, but as no effort is made to force its adoption Mr. Potter's position is plainly one of harmony and conciliation. Probably at this and other works, in the fullness of time, the influence of Mr. Potter and Mr. Carnegie, both enthusiastically in favor of the sliding scale, may secure its further trial and wider adoption.

#### Ten-Cent Copper.

Aside from conflicting rumors, nothing has thus far transpired in regard to the negotiations which have been going on in Paris since the delegates of the American mines arrived. It has been intimated that the proposal under consideration is to establish prices based on Chili bars at £40 in the London market, coupled with an agreement to reduce output to the extent of 20 per cent. The price stated would be equivalent to a shade over 10 cents for Lake copper here. Provided the leading miners all over the world undertake to faithfully abide by the restriction of production, and provided further that the banking institutions who hold the stock content themselves with marketing their accumulations slowly, say at the rate of no more than 40,000 tons annually, then the market would be on a safe basis for purchasers of the crude article and of manufactured goods. Unless these three conditions—a low price, a restriction of output and gradual marketing of the stock—go hand-in-hand, the trade will do well to touch everything connected with copper in a gingerly fashion. Prices went below £40 during the year when the speculators took hold, and then conditions were very different from what they now are. Stocks were light, consumption was heavy and many mines were on the brink of bankruptcy or had been forced to close down. Now the stock is over 100,000 tons greater, consumers are without confidence whatever and a number of producers have improved their financial position and have paid for betterments in plant and equipment.

However those who are attempting to modify the evils of the present situation may twist and turn, they will not be successful for any length of time in holding values above the 10-cent limit unless an extraordinary change takes place in the general business situation in this country and elsewhere. It is conceivable that the

long-predicted boom of 1890 may aid them, but for the near future it would be futile to hold the market above the limit which we have indicated. As it is, the very strength of the parties in control has prevented the tumble to £30 which many expected to see when the speculation collapsed.

No one in the copper trade, from the manufacturer who buys millions of pounds annually to the merchant who sells moderate invoices of finished goods, wants to struggle through the anxieties and losses of a demoralized market. But all will welcome a return to a sound basis.

During the past few months a number of newspapers throughout the country have been discussing the point as to whom the important post of superintendent of the next census should be intrusted. The one most prominently mentioned has been Joseph D. Weeks, for many years associate editor of *The Iron Age*, and for some time past editor of the *American Manufacturer* and *New World*, of Pittsburgh. Mr. Weeks has been long identified with statistical research in special fields, he has been the author of an important report on labor in Europe and has been a thoughtful student of the industrial development of this country, generally speaking, and possesses that wide knowledge of the *personnel* of the leading trades to enable him to choose his associates wisely. Mr. Weeks deserves and will receive the indorsement of his friends in the iron and allied trades.

#### The Blast Furnaces on April 1.

There has been a slight decrease in the productive capacity of the coke furnaces blowing, in spite of the growing output in the South. The anthracite furnaces are about holding their own. The changes during the month develop no features pointing to any general tendency, though it must be a matter of surprise that in the unsatisfactory condition of the markets production continues so very heavy.

On the 1st of the month the status of the Anthracite furnaces was as follows:

##### Anthracite Furnaces April 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	24	11	3,557	13	3,792
New Jersey.....	13	5	2,180	8	2,392
Spiegel.....	3	3	233	0	0
Pennsylvania:					
Lehigh Valley.....	44	25	9,229	19	5,610
Spiegel.....	1	1	76	0	0
Schuylkill Valley.....	38	24	8,862	14	4,120
U. Susquehanna Valley.....	17	11	3,644	6	1,256
Lebanon Valley.....	16	12	5,528	4	1,912
L. Susquehanna Valley.....	22	10	4,058	12	4,320
Total.....	178	102	37,977	113	23,402

For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
April 1.....	102	37,977
March 1.....	103	37,937
February 1.....	107	39,187
January 1, 1889.....	107	38,723
December 1, 1888.....	99	34,879
November 1.....	95	33,645
October 1.....	95	33,723
September 1.....	92	33,541
August 1.....	93	33,397
July 1.....	92	32,478
June 1.....	99	32,418
May 1.....	96	31,003
April 1.....	94	30,496

There is nothing to report from the New York furnaces, the good record of Port Henry No. 2 having been alluded to in *The Iron Age*. We may note, however, that the Manhattan furnaces are to be abandoned. The one still running is merely working up stock, which will take till the middle of May, while the other is already being dismantled. In the Schuylkill Valley there were no changes during the month, though Warwick is soon to go out. In the Lehigh Valley Durham has again blown in and one of the Bethlehem stacks resumed. In the upper Susquehanna Valley Lackawanna is now running its five furnaces. Irondale blew out on the 2d of this month, to make repairs. In the Lebanon Valley one of the Colebrook furnaces has stopped; the second Bird Coleman, which has been undergoing repairs, started early this month.

The month opened with the following capacity working:

##### Coke Furnaces April 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,150	2	2,300
Pennsylvania:					
Pittsburgh district.....	18	17	20,886	1	850
Spiegel.....	1	1	585	0	0
Shenango Valley.....	19	16	11,338	3	1,706
Juniata and Conemaugh Valley.....	18	12	6,052	6	2,150
Spiegel.....	1	0	0	1	430
Yough Valley.....	5	4	1,612	1	600
Miscellaneous.....	4	4	2,339	0	0
Maryland.....	1	1	350	0	0
West Virginia.....	6	3	2,611	3	538
Ohio:					
Mahoning Valley.....	14	11	8,988	3	2,517
Central and Northern.....	18	12	8,574	6	4,524
Hocking Valley.....	14	7	2,301	7	2,358
Hanging Rock.....	13	8	1,910	5	1,210
Indiana.....	2	2	431	0	0
Illinois.....	12	6	7,115	6	5,515
Spiegel.....	1	1	670	0	0
Wisconsin.....	4	2	1,293	2	1,100
Missouri.....	6	2	1,046	4	1,590
Colorado.....	2	1	490	1	450
The South:					
Virginia.....	12	7	3,144	5	3,125
Kentucky.....	4	4	1,280	0	0
Alabama.....	24	20	11,678	4	1,850
Tennessee.....	11	9	4,241	2	790
Georgia.....	2	0	0	2	778
Total.....	215	151	100,060	64	34,459

As compared with previous months, these figures stand as follows:

	No. of furnaces.	Capacity per week.
April 1.....	151	100,060
March 1.....	150	100,757
February 1.....	150	98,518
January 1, 1889.....	157	108,726
December 1, 1888.....	151	101,748
November 1.....	146	94,695
October 1.....	137	85,461
September 1.....	133	81,082
August 1.....	122	74,855
July 1.....	121	69,543
June 1.....	123	75,427
May 1.....	130	75,815
April 1.....	123	70,644
March 1.....	123	68,892
February 1.....	136	73,912
January 1.....	143	83,101

In the Pittsburgh district we may note that No. 2 furnace of Laughlin & Co. has been blown out for relining. The new stack being built by the same firm will probably be ready to make iron about the middle of May. In the Shenango Valley Neshannock, a large furnace, completed general repairs during the month and blew in on the 23d ult. In the Juniata and Conemaugh district the second Rockhill was added to the list of producers, while among the furnaces grouped under miscellaneous Cameron started again on the 12th ult. Among the furnaces of Central and Northern Ohio it is to be noted that Jefferson stopped, but, on the other hand, Steubenville resumed in March. In the Mahoning Valley Haselton lost two days through a strike in March. In the Hocking Valley Glasgow was again at work. In Illinois one of the South Chicago stacks is idle. The output of the State was 35,704 gross tons.



In the South the principal facts of note are the blowing out of Crozer and No. 1 Longdale and the stoppage of work at Rising Fawn, Ga. In Alabama the fourth of the famous Ensley plant, of the Tennessee Coal, Iron and Railroad Company, started in March, but, on the other hand, one of the South Pittsburg, Tenn., stacks of the same concern was blown out. The second DeBardeleben, at Bessemer, has been blown in since the 1st inst., and we understand that the two stacks together have reached a product of 225 tons a day. Trussville, according to the latest advices, had not yet blown in.

Returns from the charcoal furnaces are not yet sufficiently complete to submit the totals. We may note, however, that returns from every maker in Michigan show a total output of 15,189 gross tons in March, so that the State is turning out iron at the rate of 3480 tons a week.

## OBITUARY.

FREDERICK SIBLEY.

Frederick Sibley, who has been connected with the Delamater Iron Works for nearly 40 years, died at his home, No 806 West Fourteenth street, 8d inst. He was born in Wales in 1822 and came to this city when a young man. He was at first employed in the Novelty Iron Works, but soon entered the Delamater Iron Works, where his brother was foreman of the foundry. At the breaking out of the war he became the foreman of the foundry and superintended the building of the Dictator and other gunboats for the Government. He was regarded by his employers as a mechanical engineer of exceptionally fine abilities.

E. P. ALLIS.

E. P. Allis, the millionaire manufacturer of Milwaukee, Wis., died suddenly on Monday evening. He was known all over the country and in Europe as the proprietor of the Reliance Works, one of the largest establishments for the manufacturing of steam and mill engines in the world. His death was wholly unexpected, as he had been in excellent health up to Sunday. He was taken with an attack of neuralgia of the stomach, which terminated fatally. Mr. Allis was born in Cazenovia, N. Y., May 12, 1824, was graduated from Union College in 1845 and left for the West at once. He was a member of the firm that built the large tanneries at Two Rivers, Wis. In 1860, with C. D. Nash and John P. McGregor, he purchased the old Reliance Works, then doing a languishing business. Before the close of the first year he purchased the interests of his two partners, and from that time on engaged in building the Reliance Works up to their present immense proportions. His fortune is up in the millions.

HARVEY P. GASKILL.

Harvey P. Gaskill, inventor of the Gaskill pumping engine, died in Lockport on Monday night. He was the vice-president and chief engineer of the Holly Mfg. Company, widely known for the Holly water-works system. He was on Monday 44 years old, and born in this State.

PHILO REMINGTON.

Philo Remington, senior member of the firm of E. Remington & Sons, of Ilion, N. Y., died at Silver Springs, Fla., 4th inst., of bilious fever. He was 72 years old and had been enjoying unusually good health for a man of his age. Mr. Remington was born in Litchfield, N. Y., October 31, 1816, and when a boy obtained from a country blacksmith the privilege of using his forge on rainy days and evenings, and with such tools and appliances as his own ingenuity suggested produced a gun.

It proved so satisfactory that he was encouraged to continue and soon established his own forge, from which has developed the great factory now known as the Remington Armory. With his brothers Samuel and Eliphalet the firm was established, and it probably manufactured a greater variety of firearms than any other like establishment. In 1886 the firm went into liquidation. Since that time Mr. Remington has lived in retirement. For 20 years he was president of the village of Ilion and has given Syracuse University sums aggregating \$250,000.

## Lake Superior Charcoal Pig.

### THE FUEL SUPPLY OF THE FURNACES.

The result of our investigation into the condition of the fuel supply of the Lake Superior charcoal furnaces is confirmatory of the statements which have been made on this subject. An undoubted shortage exists at present at a very considerable number of the furnaces. And unless this shortage can be corrected by favorable conditions during the summer there will be a shrinkage from this and other causes of 25 to 80 per cent. in the output of Lake Superior charcoal pig iron. The information we have received on this subject is very full and complete and is probably as reliable as it is possible to make it thus early in the season. The low price of iron now ruling naturally imparts a feeling of depression to the entire trade, and almost forbids a display of energy which would in any degree increase expenses. If an advance should occur from any cause, it is very likely that ways would be found of covering at least a very considerable part of the fuel deficit. Most of the letters we have received are very short and their contents cannot be quoted. Those which enter into the discussion of the question to some extent are as follows:

#### LOWER PENINSULA OF MICHIGAN.

A Detroit furnaceman of much prominence in the trade thus writes:

We buy our charcoal. Those from whom we purchase assure us that they are well stocked with wood. The managers of three furnaces here have told the writer that their plants were well stocked with wood. The quantity of iron made by the four furnaces located here will probably be less than last year, as two of them contemplate making alterations and repairs during the summer months. These alterations will probably consume more time than when making ordinary renewals. We may repair, but intend to run as long as our hearth will permit. If we go out for repairs we will make from 20 to 25 per cent. less than usual. If we have a well-assorted stock of iron on hand when ready to go in blast, with a light demand for the same, we would remain out until the assortment was broken or the demand improved. I should be glad to see an improvement in the demand and price of Lake Superior charcoal pig iron, but it is my candid opinion that if it is gotten up on the cry of short wood crop it will be at the expense of truth.

The manager of another furnace company in the same locality sends us the following:

We beg to say that we do not make any charcoal ourselves, but buy all that we consume from contractors. Thus far we have had no difficulty in obtaining an abundant supply, and do not anticipate any shortage during the summer that will affect our product. The other furnaces in our vicinity derive their supply largely from the northern part of the State, where, though there has not been as much snow as usual, there has been enough for a person with ordinary energy to obtain a supply of wood.

The treasurer of another furnace company in the southern part of the State sends us the following information:

We would say that, from the causes you mention and others, our production is liable to fall short 2000 tons this year.

From the same locality comes the following communication, which, though brief, states an important fact having its bearing on the situation:

At about one-half of our kilns, situated in the northern part of the State, we purchased our usual supply of wood. At the southern kilns, however, we are about 2000 cords behind last season. It is likely we will make from 3000 to 4000 tons of iron less this season than usual.

The other replies received from this section were short, and merely covered the interrogations sent out. The Iron Star, Frankfort, Bangor and Caseville furnaces, which are still carried in the list of active furnaces, will not be operated this year. Of these, the Bangor was the only furnace making iron last year, and to the extent of its production this season's output will be reduced.

#### THE UPPER PENINSULA OF MICHIGAN.

The manager of one of the best-known furnaces writes us as follows:

At most of our kiln jobs our supply of wood for charcoal is about 25 per cent. under what we usually have at this time of the year. If we should have a wet season, which would prevent the drawing in of wood on wagons, the restriction of pig iron will naturally be in about the same proportion. We hope to be able to get in some wood during the dry months of the summer to relieve us and make up our deficiency. Still, I am inclined to think that the product of charcoal pig iron this year will be less than last.

The superintendent of a neighboring furnace writes that his stack will be blown out this summer and that the production will fall short of that of 1888 by about 3000 tons. Of the other furnaces, some have secured all the wood they need, while some are short of fuel, with hardly a possibility of getting a sufficient supply during the summer. The Jackson made iron last year, but will make none this year if present conditions continue. The Iron River has changed hands, but it is doubtful if it will be started up. The Menominee Furnace, which is still carried on the active list, may safely be considered abandoned.

#### WISCONSIN.

The charcoal furnaces in this State are generally short of wood from 20 to 25 per cent. A letter from one of the fortunate possessors of a good supply is as follows:

So far as this furnace is concerned, its supply of wood is deemed all-sufficient to enable it to run without interruption throughout this year at the rate of 1600 to 1800 tons of output monthly. The situation of the charcoal pig iron market is certainly bad enough. There seems little hope of any improvement in the near future. Among the furnaces, only the fittest are likely to survive. Possibly after the season's prices for ores are known a better outlook may become apparent. Within a month the worst, in this regard, will be known. The outlook is not favorable to an increase over last year's prices, as miners of ores must see very soon if they want to make sales.

Another furnace manager writes that the short supply of fuel which he has secured will cut down the production of his furnace at least 4000 tons. Other furnaces, which had previously depended on their own wood supply and charcoal kilns, have found it necessary to contract with outside parties to furnish them with charcoal, which will of course cost them more than if they had been able to cover their own wants. The Appleton Furnace, which was burned down last year, will not be

rebuilt, so that its production is eliminated from this year's output. The Fox River Furnaces, which have not been in blast for several years, are now being torn down and their machinery is being sold for scrap. The Florence Furnace has also been permanently abandoned.

#### SUMMARY.

It will not escape the attention of well-informed readers that improvements have been made in charcoal furnace practice which will largely increase the average output per stack as long as fuel can be had in sufficient supply. This is a matter to be considered in calculating the probable decrease in production of the entire region. It will be found, however, on careful investigation that the best furnaces have not all been favored with a bountiful supply of fuel, and therefore fast driving is hardly to be an event of conspicuous moment this year, unless prices so advance that the cost of material need not be figured quite so closely as at present. But allowing for all such influences, the information we have collected points to a reduction of at least 25 per cent. and probably 30 per cent. as compared with last year. The tonnage thus promising to be cut off is quite considerable. In 1887 Michigan produced 190,000 gross tons of charcoal pig iron and Wisconsin 42,000 tons, or a total of 232,000 tons. In 1888 Michigan again produced 190,000 tons, while Wisconsin turned out 62,000 tons, or a total of 252,000 tons. If this should be reduced 25 per cent. the falling off would be 63,000 tons, and 30 per cent. would be 75,000 tons. It is hardly possible that such a shrinkage would take place without materially stiffening prices, although the full effect might not be felt until some time in the summer or fall, after the usual season contracts for pig iron had been made by the large consumers.

## CORRESPONDENCE.

### Commissions on Canceled Contracts.

*To the Editor:* We beg to ask your opinion in regard to the question of settlement of commissions due on contracts for pig iron made for the account of furnace companies we represent. As a case in point, we would say that we are agents for certain furnace companies, and for them make contract for delivery of several thousand tons of iron, to be delivered in certain quantities at stated intervals. Now, if through no fault of ours this contract is canceled by either party, and that party going beyond the provisions granted in the terms of the contract as reasons for cancellation, are we not then entitled to our commission? Your reply will oblige

Yours very truly,

H. S. JACKSON & Co.

The right of the agent to his commission arises as soon as he renders the service for which he was employed. When he has done all that he was required to do and performed his part of the transaction, and the agreement between himself and his principal leaves no other material act or service to be accomplished, the agent, broker or factor is entitled to receive his commissions, without regard to the future conduct of the parties whom he represented and whom he has brought together. To apply this general rule to the case in question, where the agent or middleman is employed to make contracts of sale, to bring together seller and purchaser and under the powers conferred upon him by the seller to fix the terms of the sale, the price, the term of credit, the place of delivery and similar details—for such, we would infer, is the authority of an agent

employed for such a purpose—the agent's work is done when this contract is completed and perfected. He becomes entitled to his commission at once, and the fact that the buyer does not pay the price, or that either or both of the parties refuse to abide by their contract or mutually agree to cancel it, cannot affect the broker's right to his commission.

It may be remarked here that one party to a contract cannot cancel it without the consent of the other party. Either party may, of course, refuse to fulfill his promise, but the contract remains valid, and he who withdraws does so subject to all the penalties which the law provides for breach of contract. Nor does the agent's or broker's right to his commission depend on the question as to which party withdraws. If the seller for any reason after the contract is made sees fit to repudiate it, it is quite plain that his act cannot work to the injury of his agent. We believe every one will admit this without hesitation. Any other rule would simply destroy any legal claim on the part of an agent to a commission, as the principal would always have it in his power to avoid the payment of the commission by rescinding or pretending to rescind his contract. But it might be thought that this rule would not apply so strongly and cogently to the case of the purchaser who refuses to carry out his agreement. He is some one whom the agent has found and selected, and the seller might feel disposed to insist that the broker should be responsible for him, and that the commission should depend on the purchaser's proper fulfillment of his agreement. In other words, if the latter refused to pay or to accept the goods, the broker should lose his commission. But, on the other hand, the broker is employed to do a specific thing—to make the contract of sale—and his compensation for his services is usually contingent upon his success. If he renders the service, and has done all that lays in his power within the terms of his employment, he should not be held responsible for a breach of the contract occurring without his fault and beyond his control.

The infallible test to be applied to any case in which this question may be in dispute would seem to be this: What is the service for which the agent has been employed? Has he accomplished it? If so, he is entitled to his commission. The responsibility for the future relations of the seller and the purchaser rests with themselves. These views are confirmed by the adjudications of the highest appellate courts of the States. In New York it was held that where a broker was employed to sell land, and made a proper bargain or contract of sale, he was entitled to recover his commission, although the purchaser subsequently refused to take the title or pay the purchase price. In another case where goods were sold to arrive on a certain vessel by a broker employed by the seller for that purpose, he was awarded his commissions on the sale, although the goods as a matter of fact never did arrive. There may be a limitation of this rule if any element of fraud enters into the transaction. The contract of sale effected by the agent must be an honest, *bona-fide* contract. It should not be made with irresponsible parties, merely for the purpose of enabling the agent to claim a commission. The

agent must exercise the same judgment in these matters as a prudent business man would in his own business. The law would not tolerate a claim for an agent's commission on contracts of the kind if these contracts were reckless and improvident and not likely to be carried out by the purchaser. It should always be remembered also that the instructions of the principal must be scrupulously followed by the agent. A deviation from them in a material point would undoubtedly destroy the claim for a commission, and this probably whether the contract was accepted and carried out by the principal or not, or whether the principal suffered any appreciable damage or otherwise.

We have hitherto been treating of the agent's general right to his commission, in the absence of any special agreement between the agent and the principal as to that subject. Any definite arrangement between them would, of course, govern, and so far modify the general rules. These general rules are the provisions of the law for cases where there has been no special agreement. The principal and his agent may agree, for instance, that the commission shall be paid only in the event of the completion of the purchaser's contract, or that the commission shall be a percentage of all moneys received by the seller on contracts made by the agent. Whatever the terms of this arrangement may be, they will control the rights of the parties, and will vary in each particular case, so that no definite rule can be laid down in regard to them.—EDITOR.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 9, 1889.

Mr. Scott, president of the Union Iron Works, of San Francisco, speaking of shipbuilding on the Pacific Coast, says that the results in the production of high standards of steel at San Francisco have been better than in the East. When asked how he accounted for that, he said: "In the East the manufacturers use poor material and supplement it with skill. On our coast we use only the best materials." He says that the Charleston is now in the hands of the Government inspectors. The San Francisco will be ready for launching in August. Mr. Scott further says that since they began work on the Charleston they have turned out 13 steel vessels for the merchant marine of the Pacific, one of them for the Canadian Pacific Railroad. He thinks that iron and steel shipbuilding has a great future on the western shores of the continent, and claims that San Francisco will now hold the relation to the shipbuilding industry of the Pacific that the Delaware does to that of the Atlantic.

The Secretary of the Navy has no idea of undertaking the administration of his important department without first informing himself as to some of the salient points and details of its work. During the past week Secretary Tracy has been giving his attention to the condition of the navy yards at Washington, League Island and Brooklyn. He proposes also to inspect the navy yards at other points. The Secretary, in conversation, says: "It is now time for the Government of the United States to inaugurate a system of naval reconstruction which will place the United States on a par with the most formidable powers of the globe. Within the past two or three years the Government has had its pride considerably humbled when considering the probability of war with

Great Britain on the fisheries question, and more recently during a similar condition of affairs with Germany in regard to Samoa." He said that he did not see why the United States, the only nation in the world reducing the principal of its national debt, with a surplus of \$100,000,000 in the Treasury and with redundant revenues, should not embark at once in the building of a large fleet of steel cruisers and armed vessels, with armaments consisting of guns of the highest power and appliances of destruction more formidable than any known to the other governments of the world. The Secretary is in favor of the authorization of the expenditure of \$15,000,000 or \$20,000,000 a year for a series of years for war ships, so that in case of further repetitions of war-like situations the Government may be in a condition to conduct its negotiations without feeling the demoralizing influence of an inability to proceed at once to war should the peaceful methods of diplomacy fail.

Charles Cramp, of Philadelphia, and Mr. Scott, of the Union Iron Works, San Francisco, who are bidders for the new coast defense ship, have had several conversations with the Secretary of the Navy in reference to the details of their bids. The Cramps, of Philadelphia, were the lowest bidders, but made some exceptions in regard to the special designs for boilers. The award has been withheld until the heads of the bureaus make an investigation and report, which has been ordered by the Secretary. Mr. Cramp is not confident of the results from the form of boilers proposed, which at this stage are experimental. Mr. Scott accepts the plan and guarantees the results. The new ship, which is of monitor type, will be one of the most formidable fighting vessels afloat. The theory of construction, besides a maximum defensive strength, is an ability to sink the vessel in action, which simply exposes the turret and deck. It is proposed also to make her armament more powerful than that on any vessel of war. She will have a battery of the largest rifle guns in the barbettes, besides a dynamite bow gun of the greatest power and a full complement of guns, with the latest improvements in rapid firing. It is expected that it will require at least three years to complete the vessel.

The Terre Haute Iron and Nail Works, Terre Haute, Ind., have about completed two Smith gas heating furnaces, with working hearths 7 x 16 feet, together with the necessary gas-producers, flues, &c., plans for which were furnished by Alex Laughlin & Co., of Cleveland, Ohio. These gas-producers are divided into four independent batteries connecting with one main flue by means of independent flues. The latter are provided with gas-tight dampers, thus allowing any battery of producers to be cleaned without inconveniencing the furnaces from shortage of gas.

Milliken Bros., 61 Liberty street, New York, have issued a circular calling attention to the rolled-steel flooring plates for which they are agents. They state that they are able to make these plates from  $\frac{1}{4}$  inch to any thickness and almost of any desired size. The raised portion projects  $\frac{1}{4}$  inch from the surface of the plate, and adds about 2 pounds per square foot to the weight of an ordinary plate. For equal strength its weight is only about one-third or one-half of cast iron. They make ribbed, checkered and diamond plate.

The Greensburg Press has published an anniversary edition, which contains a number of articles dealing with the manufacturing industries of the town and its resources, among which coke and natural gas are prominent.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, April 8, 1889.

Lake navigation was resumed last week, the continued mild weather having opened the Straits much earlier than usual. Shipments of Ore began from Escanaba, and at other lake ports active preparations for business were made by the vesselmen. An impetus will necessarily be given to general business throughout the great extent of territory tributary to the lakes, which must have a favorable influence, as such a large number of men and such a variety of interests are now affected by the huge traffic on these inland seas. Railroad freight rates will very probably be reduced at an early day, to compete with water rates, but, as the volume of business will be increased by the resumption of all classes of outdoor activities, the roads may be even then in a better financial position than they now are. The hope for the future lies mainly in that direction. The railroads of this section are still purchasing supplies too sparingly to make the Iron trade reasonably healthy and vigorous.

**Pig Iron.**—Weakness in Southern Coke Iron developed to some extent during the past week. Low-grade Foundry, Gray Forge and Mill Irons were offered at rates to compete with local Coke Iron, but it is not certain that any large sales were made. Ohio Soft Irons were in moderate demand, and prices were sustained at old figures. Lake Superior Charcoal Pig showed some signs of life, two or three large consumers having made large contracts for considerable quantities. Concessions were obtained, according to report, but it is claimed at the same time that the cut was not heavy. Some of the companies state that they are willing to reduce prices slightly on small quantities for early delivery, but insist that they must get a higher price for contracts covering the year. They look forward to an advance by midsummer or a little later, and they want a share in it. The expected restriction of production from the short fuel supply and other causes is having an effect on those who are endeavoring to forecast the future. At the same time the very low prices now ruling for Coke Pig are conceded to be making an impression on the consumers of Charcoal, inducing them to substitute the former wherever practicable. A small cloud is appearing on the horizon also in the shape of Southern Charcoal Pig, which is now being offered here at rates below those asked for Lake Superior. If the quantity available for this market were not limited the effect on the Northern Charcoal Iron would be decidedly apparent. Cash quotations are about as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, \$17 @ \$17.50; Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, all numbers, \$19 @ \$19.50; American Scotch (Blackband), No. 1, \$18.50 @ \$19; Jackson County Silvery, No. 1, \$18 @ \$18.25; other Ohio Soft Irons, No. 1, \$17.25 @ \$17.50; Southern Coke, No. 1 Foundry, \$15.75 @ \$16.25; No. 2 Foundry and No. 1 Soft, \$15.25 @ \$15.75; No. 3 Foundry, \$14.75 @ \$15.25; Gray Forge and No. 2 Soft, \$14 @ \$14.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18.

**Bar Iron.**—Quite a good business has sprung up lately, and the mills are stiffer. Toward the close of the week inquiries were much more numerous, and large consumers are now feeling the market with a view to placing orders for their year's sup-

ply on the low basis now ruling. The belief grows more general that bottom has been touched for the present. Orders for nice specifications, including large proportions of light Irons, have been refused by mills at prices which would have been accepted gladly but a short time since. Shrewd buyers are anticipating a reduction in freight rates from the Valley, and ask for quotations at mill so that they will get the benefit of the reduction. The rate is now 13¢ @ 100 lb. The quotations for Chicago delivery of mill lots of Common Iron range from 1.60¢ to 1.65¢, half extras. Small lots are held from store at 1.80¢ @ 2¢, according to quantity and quality.

**Structural Iron.**—Unusual activity is being displayed in the remodeling of business structures in this city, and small orders for Beams are consequently very numerous. Bridge stuff is still in light demand. Mill lots are quoted as follows, f.o.b. Chicago: Angles, 2.15¢ @ 2.20¢; Sheared Plates, 2.15¢; Universal Plates, 2.20¢; Tees, 2.50¢; Beams and Channels, 2.90¢. From store Angles are quoted at 2.30¢ @ 2.50¢; Tees, 2.70¢; Beams and Channels, 3¢ @ 3.40¢.

**Plates, Tubes, &c.**—A quiet week was experienced in this line. Some mill orders were taken and store trade was fair, but nothing worthy of special note occurred. Prices are unchanged.

**Sheet Iron.**—Quite a heavy inquiry is reported from large buyers, but the 1st of July is looming up in the distance with a possibility of complications in the adjustment of wages at that time, and the mills are stiffening on late deliveries. An advance of \$1 @ ton is asked by some of the mills. A fair quotation now seems to be about 2.95¢, f.o.b. Chicago, for mill lots of No. 27 Common. Small lots from store are sold at the rate of 3.10¢ @ 3.20¢ for No. 27.

**Galvanized Iron.**—The association of manufacturers has been disrupted by the withdrawal of one of their number, but as far as can be ascertained prices have not been changed. In view of the lack of harmony thus manifested this appears singular. Business in this section has been very quiet during the week just ended. Small lots are still quoted at 65¢ off for Juniata, and 65¢ and 2½¢ off for Charcoal.

**Merchant Steel.**—The improvement noted for the past three weeks gives no sign of abatement, but appears to be gradually widening, taking in a large circle of consumers of all grades. Prices are unchanged, being apparently very steady at former quotations.

**Steel Rails.**—Business for a month or more has been confined to small lots running from 500 to 2000 tons. One order of about 8000 tons has been practically secured for the local mills quite recently, and a great deal of work is in sight which will probably be decided upon within 30 days. The situation, therefore, cannot be considered either very discouraging or entirely satisfactory, but it appears to be improving, and the manufacturers are feeling more cheerful over the outlook. Quite a number of railroad projects, involving the purchase of large quantities of Rails, are taking shape, and will be launched as soon as the conditions are propitious. Quotations range from \$30 to \$30.50 for ordinary quantities.

**Old Rails and Wheels.**—A considerable quantity of Old Iron Rails was sold last week. The bulk of it brought \$20.50, which seemed to meet the views of those who are in need of this class of stock. One lot was disposed of at \$20.25 to distant parties, while another lot brought \$20.80. This active movement of the past 30 days has pretty well cleaned up stocks in this immediate locality. The Valley mills are in the market for Old

Rails, but at prices a little too low to take them from here. Old Car-Wheels have not been so dull for years. The Wheel manufacturers are taking a great many in exchange for new Wheels, so that they are not seeking any from outside parties. It is claimed by consumers that \$18 is a fair price for them, but holders ask \$19.

**Scrap.**—The market has again relapsed into dullness. Quotations are largely nominal in the absence of trade. No. 1 Forge or Railroad Shop is quoted at \$18.50 @ \$19, but there are no buyers, and some dealers are unwilling to pay more than \$16.50 for stock. No. 1 Mill is held at \$18.50 @ \$14  $\frac{3}{4}$  net ton from yard, and Machinery Cast at \$13, but further quotations are useless in the present state of the market.

**General Hardware.**—The demand for Shelf and Heavy Hardware keeps up very well. The general intelligence received from traveling men is very encouraging, and the prospects are very bright for a good year's trade in every section tributary to this distributing center. Thus far the Iowa railroad freight rates, which are reputed to be disturbing some branches of Chicago's wholesale trade, do not seem to have affected the Hardware interests. If they do it will probably become noticeable when trade is dull. The demand for Bicycles noted last week continues with undiminished vigor. No change in prices has occurred since our last report. Collections are good and are growing better as the season advances.

**Nails.**—Manufacturers' agents report but a light movement in Steel Nails. Discussing the effect of the Jefferson circular, quoted last week, it is claimed by Cut Nail salesmen that if it should be generally adopted by the trade a severe blow would be dealt to the Tack and Small Nail makers and the Wire Nail manufacturers. It would be necessary, in order to secure the lowest prices named, for merchants to include in their assortments three-penny Fine and other Small Nails with high extras, thus restoring a trade to Cut Nail manufacturers which has largely been lost by that interest. Jobbers' prices are as follows: Small lots of Steel Nails, \$2, and carloads, \$1.95; small lots of Wire Nails, \$2.40, and carloads, \$2.35; Wire Nails are occasionally shaded to good buyers, but Steel Nails are quite firm at quotations.

**Barb Wire.**—Manufacturers are running behind on their orders and Barb Wire is beginning to get scarce. Prices, however, are about as they were, jobbers quoting Painted at 2.75¢ @ 2.80¢ for small lots, with 60¢ @ 65¢  $\frac{3}{4}$  100 lb advance for Galvanized.

**Pig Lead.**—This market has been remarkably quiet for some time. The sales of the past week footed up about 200 tons at 3.45¢. At the close 3.40¢ was bid, and 3.45¢ asked. Consumers are still holding off expecting to buy lower, but thus far sellers have not been disposed to meet their views.

Dan P. Eells, president of the Calumet Iron and Steel Company, has resigned his position on account of the pressure of other duties, and Charles Himrod was elected to succeed him, at a meeting of the Board of Directors on the 6th inst.

August Pollak, dealer in Old Railway Material, Scrap Iron, &c., has purchased a lot 100 x 300 feet, at the junction of the Chicago and Western Indiana with the Michigan Central and Illinois Central railroads, to be used for an Iron yard. He will put in shears and all necessary fixtures for his purpose. He will retain his city office in the Exchange Building.

R. C. Hannah, secretary of the North Chicago Rolling Mill Company, returned

last week from a pleasure trip to the West Indies and the northern coast of South America.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 9, 1889.

**Pig Iron.**—There has been more activity during the week, but as regards prices the results have not been satisfactory. Some brands are held at firm prices, and are readily taken at full quoted rates, while others have found it necessary to shade a little in order to retain their trade. A good deal depends on the delivery. At some points Southern and Western Irons have advantages, in others they have disadvantages, so that prices have to be twisted accordingly. The net result, however, has not been in sellers' favor, although the increased demand ought to admonish consumers that there is a limit to these things, and that it cannot be far from to-day's prices. On the whole, and in spite of the unsettled condition of the market, the trade have about made up their minds that quotations will not go below what they are to-day. Sales may be made at less in exceptional cases, but it is thought that the general market will not go below \$17.50 @ \$18 for No. 1, delivered, or \$15 @ \$15.25 for Gray Forge. Certain lots, under special circumstances, may be picked up as bargains at less money, but a wholesale reduction in the output would be made rather than continue making Iron for any market which could not at least promise to-day's prices. At the moment the slightly improved demand is offset by the greater urgency to place Southern Irons. At certain points usually regarded as equivalent to Philadelphia deliveries competition is very severe. It may cost a Lehigh or Schuylkill furnace, say, 20¢ or 25¢ extra to reach a certain point near Philadelphia, while a through rate from the South may give as much of an advantage to the more distant furnace, and 40¢ @ 50¢ difference is not easily overcome in times like these. This is one of the problems which can only be solved by a readjustment of demand and supply; and time alone can accomplish that. Stocks of Iron are believed to be very moderate, so that any improvement in the demand would soon be reflected in prices. The impression is that such an event is near at hand, although in the meantime there is nothing more than general principles upon which to base such an opinion. Still, it will be contrary to all former experience if the turn does not come soon, and when many least expect it. Prices have varied greatly during the past week. Some prime brands of No. 1 Foundry command as high as \$18.50, delivered, others from \$17.50 to \$18, down to \$17 for Southern brands. Mill Irons have not varied to the same extent, \$14.75 for Southern being the lowest, up to \$15.50 for favorite Pennsylvania brands, with average qualities at about \$15. As a matter of fact, \$15.25 is the usual asking price, but several lots of good Iron have been picked up at \$15, delivered.

**Blooms.**—There is a moderately good demand for Steel Blooms, and sales continue to be made at quotations about as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33  $\frac{3}{4}$  "Bloom" ton of 2464 lb.

**Muck Bars.**—The market is not specially active, as buyers are not inclined to meet the increased demands of holders. There are plenty of bids of \$26 @ \$26.50, delivered, but \$27 @ \$27.50 is asked, with a few small sales at the inside rate.

**Bar Iron.**—There is nothing in the way of improvement to note in this department. In some cases mills are fairly employed on local orders, but the majority are running irregularly and not nearly up to their average; some, owing to labor troubles, &c., have shut down entirely. There is not much new work in sight at the moment, and from present appearances things seem likely to drift along in their present condition for some time to come. Prices are about the same as last week, say, \$1.75 @ \$1.80, nominal, but a great deal of business is taken at about \$1.70 for what is claimed to be first-class quality of Iron. Skelp is neglected, and prices entirely nominal at \$1.75 for Grooved and \$1.85 @ \$1.90 for Sheared.

**Plate and Tank Material.**—There has been more business on the market, and on the whole mills are better supplied with orders than they have been for some time past. This may not apply to every mill, as some are still short of orders; but the general position is improving, and prospects are still more favorable for the near future. Some of the largest consumers of Plates have recently taken a great deal of work, so that a continued good demand for Plates is a matter of certainty. Prices, however, are still unsatisfactory, although they are felt to be at absolutely rock bottom, with some disposition to ask a slight advance for late deliveries. Ordinary quotations are about as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.8¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 $\frac{1}{4}$ ¢; Fire-Box, 3 $\frac{1}{4}$ ¢ @ 3 $\frac{1}{2}$ ¢.

**Structural Material.**—The mills have taken on a good deal of work recently, and in most cases they are now running full time. The outlook is considered to be decidedly favorable, as a large amount of work is in a fair way for being closed within the next few weeks. Of course there is always more or less delay in reaching a final conclusion, but that the work has to be done, and will be done soon, is a matter of certainty, so that manufacturers feel quite encouraged by the outlook. Meanwhile specifications are coming in quite freely on orders taken some time ago, so that mills are showing a considerable amount of activity. Prices remain as before, viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet Iron.**—The demand is about fair; some mills report an active business in specialties, others say they find things very dull. Prices are steady, and in most cases about as follows for car load lots:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, $\frac{1}{4}$ ¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 $\frac{1}{4}$ ¢
Best Soft Steel, Nos. 21 to 24.....	3 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 25 to 26.....	3 $\frac{3}{4}$ ¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67 $\frac{1}{2}$ %

**Steel Rails.**—There is but little change to report in this department. Inquiries are being made for good sized lots, but buyers are either not ready to place their orders, or are waiting to see if lower prices will be accepted. Manufacturers are very firm, however, and \$27.50 @ \$28, at mill, are inside quotations, with sales during the week all at \$28 for lots of a few hundred tons each.

**Old Rails.**—There is nothing doing in this market, so that prices are purely nominal. Buyers could be found at about \$23



for T's, f.o.b. cars here, but there are none for sale unless at \$24 and upward. Lots delivered at near-by mills command from \$23.50 to \$24 for such quantities as buyers require for immediate use.

**Scrap Iron.**—There is more inquiry for Scrap, with \$20.50 bid for cargoes, April and May shipment. Small lots sell at about the rates quoted below, viz: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The demand is fair and prices steadier than they have been for some time past. Prospects in this department are believed to be improving. Discounts as follows: Butt-Welded Black, 55%; Lap-Welded Black, 65%; Butt-Welded Galvanized, 45%; Lap-Welded Galvanized, 55%; Boiler Tubes, 62½%.

**Nails.**—There is a better demand for Nails, and stocks are rapidly decreasing. This is due largely to a reduction in the output, which is likely to be made still more important, as the Atlantic Association is arranging for a further curtailment by its members. Prices are nominally \$1.90 @ \$2 from store, but there is great irregularity in carload lots.

The dissolution of the firm of Lindsay, Parvin & Co. is announced. The business of the old firm will be continued by James G. Lindsay & Co., at their former address. Mr. Parvin has also taken offices in the Bullitt Building, and will do a similar business under the firm name of Parvin & Co.

## St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,  
St. Louis, April 8, 1889.

**Pig Iron.**—Business during the past week has been stagnant. Agents are all complaining of the scarcity of orders, and there does not appear to be anything in the near future upon which they can base any calculation for early improvement. Large buyers seem rather chary about placing orders at present, why it is difficult to determine. Their stocks are generally reported as being light, and prices are as low as they have been for some time, and it certainly seems a favorable opportunity to purchase, as it is hardly probable that prices can go much lower, as it is pretty generally conceded that quotations ruling to-day are close to cost price, although on an order for a good-sized lot even these figures might be shaded somewhat, as furnaces prefer to sell at cost rather than stock up the Iron on the banks. We repeat quotations of last week, which in the absence of sales are to a certain extent nominal:

Southern Coke, No. 1 Foundry,	\$15.50 @	\$16.00
Southern Coke, No. 2 Foundry,	15.00 @	15.25
Southern Coke, No. 3 Foundry,	14.50 @	14.75
Gray Forge.....	13.50 @	14.00
Ohio Softeners.....	18.00 @	20.00
Lake Superior Charcoal.....	21.00 @	21.50

### Missouri.

Charcoal Foundry, No. 1.....	16.00 @	16.50
Charcoal Foundry, No. 2.....	15.00 @	15.50

### Tennessee.

Charcoal Foundry, No. 1.....	17.50 @	18.50
Charcoal Foundry, No. 2.....	16.75 @	17.50

Connellsville Coke, f.o.b. East St. Louis, \$4.70; St. Louis, \$4.85.

**Bar Iron.**—No improvement can be reported in this department as far as prices are concerned. Mills are hopeful, however, and with the renewal of railroad work, which now looks probable, anticipate some improvement over the low prices which have been ruling for the past few months. Mills are kept fairly busy,

although they claim that a number of orders have been taken on which first cost was hardly realized. We quote as follows: Lots from store \$1.80; carload lots from \$1.60 to \$1.70, according to circumstances.

**Barb Wire.**—A large amount of Barb Wire is being sold, as is usual at this season of the year. Merchants are stocking up for spring trade, which has already commenced, and, as they anticipate a large trade, manufacturers are accordingly more sanguine as to the ultimate outcome as regards prices, and say an advance is in order, and should the present demand continue expect to see their way clear to advance prices to a point which will enable them to do business with some profit, which they claim they have not been able to do for some time. Mills quote as follows for carload lots: Two and Four Point Painted, \$2.80; Two and Four Point Galvanized, \$3.40, f.o.b. St. Louis. Less than carload lots, 5¢ additional.

## Louisville.

LOUISVILLE, KY., April 8, 1889.

**Pig Iron.**—The market has remained quiet during the past week, sales in small quantities only being reported, the demand for Strong Mill Irons being most active. The slight advance in prices which took place recently has not been followed by any further increase in the value of Iron, and some sales are reported within 75¢ a ton of the lowest price at which Iron has been sold. We quote as follows:

Southern Coke, No. 1 Foundry,	new classification.....	\$14.75 @	\$15.25
Southern Coke, No. 2 Foundry,	new classification.....	14.25 @	14.75
Southern Coke, No. 3 Foundry,	new classification.....	13.75 @	14.25
Gray Forge.....		13.25 @	13.75
White and Mottled, different grades.....		12.75 @	13.25
Silver Gray, different grades.....		13.00 @	13.50
Southern Charcoal, No. 1 Foundry		16.25 @	16.75
" " " " " " " " " " " "		14.75 @	15.25
Southern Car-Wheel, standard	brands.....	21.75 @	22.75
Southern Car-Wheel, other brands		18.00 @	19.50
Hanging Rock Coke, No. 1 Foundry.....		15.50 @	16.00
Hanging Rock Charcoal, No. 1 Foundry.....		19.50 @	21.00
Hanging Rock, Cold Blast.....		20.75 @	23.75

## Cleveland.

CLEVELAND, April 8, 1889.

**Iron Ore.**—The market is now fully opened, and substantial orders for new Ore are being placed every day. The heavy buyers at Pittsburgh and in the Mahoning and Shenango valleys are beginning to make their purchases, an indication that prices are firmly established and that lake freights have been forced down to as low a point as may be hoped for. During the past three or four days there have been sold probably 400,000 tons of new Ore. Included in this lot was about 30,000 tons of Bessemer Ore containing less than 0.02 of phosphorus, at \$6.25, f.o.b. vessels Cleveland. This is a favorite grade of Ore, and is usually expected to command 50¢ more per ton than other Bessemer. Sales aggregating 75,000 or 100,000 tons of Republic Ore have occurred at \$5.75, f.o.b. vessels Cleveland, Fairport and Ashtabula, and probably 40,000 tons of Champion Ore have been taken at the same figure. Menominee Range Ores, both Bessemer and non-Bessemer, are being sold to furnacemen in the East at \$5.10 @ \$5.20 for the former and \$4.10 @ \$4.20 for the latter, f.o.b. vessels Buffalo. It is estimated that the total amount of Ore already sold for delivery to Eastern furnacemen, who have hitherto bought foreign Ore almost exclusively, will aggregate 350,000 tons. Included in this amount is a round lot of Vermillion Ore, which will be carried from Two Harbors to Buffalo at \$1.25 per ton, and which will be delivered at Buffalo at

\$5.75, f.o.b. vessels. Inquiries are now being received for No. 1 Specular and Magnetic Ores of non-Bessemer quality at \$5, and sales will likely be made at that figure during the coming week. Gogebic Bessemer are in excellent demand at about \$5.15 @ \$5.25, f.o.b. vessels Cleveland. A considerable quantity of the best Gogebic Ores has been sold at \$5.25, a price about 20¢ or 25¢ above the opening price for the same Ores last season. The sale of about 10,000 tons of Non-Bessemer Hematites is said to have been made at \$4, the Ore to be delivered at Lake Erie ports. The vessels of the consolidated Steel companies at Chicago have already begun the work of bringing to that city the new Ore purchased three weeks ago. The first cargoes of new Ore are looked for at this port in ten days or two weeks. Less than 15,000 tons of unsold Ore remains on the docks at Lake Erie ports. Lake freights seem permanently fixed at \$1.25 from Ashland and Two Harbors; \$1.15 from Marquette and \$1 from Escanaba. Contracts for bringing Ore from Marquette to Cleveland, Lorain, Toledo, Fairport, Ashtabula and Erie from the opening of navigation until September 15 have been made at \$1.15 per ton. Quotations for new Ore have been fixed at the following figures, f.o.b. vessels, Lake Erie ports.

No. 1 Specular and Magnetic Ores,	Bessemer quality.....	\$5.75 @	\$6.00
No. 1 Specular and Magnetic Ore,	Non-Bessemer quality.....	5.00 @	5.25
Red Hematite Ores, Bessemer quality.....		5.00 @	5.25
Red Hematite Ores, Non-Bessemer quality.....		4.00 @	4.15
Menominee Range Ores, Bessemer quality.....		5.00 @	5.25
Menominee Range Ores, Non-Bessemer quality.....		4.00 @	4.10
Gogebic Range Ores, Bessemer quality.....		5.15 @	5.35

**Pig Iron.**—Transactions are still limited, and the scattering sales reported are unimportant. This lack of activity is, however, no more apparent than has been the case for the past two weeks, and sellers seem even less disposed to place their Iron upon the market at a sacrifice. The situation is not regarded as wholly discouraging, both buyers and sellers looking for better things in three or four weeks.

**Old Rails.**—There is a fairly good demand for old American Rails at \$22.75 @ \$23, and a small lot is said to have commanded the latter figure. Old Wheels at \$19 are selling quite freely.

**Nails.**—Steel Wire Nails are steady and in fair demand at \$2.35, but Steel Cut Nails have declined to \$1.90 per keg.

## Birmingham.

BIRMINGHAM, ALA., April 8, 1889.

While the bottomward tendency of prices seems still to prevail, it may be said upon the whole that there is a better feeling. Still, there seems to be some diversity of opinion as to what the outlook is. An experienced ironmaster talking to your correspondent appeared rather the reverse of hopeful, dwelling principally upon the disadvantage Southern Iron is at in remoteness from the great markets and consumption of the North. While the rates appeared reasonably low from this place to the chief Northern markets, Southern roads were not nearly able to compete with rates made for Northern furnaces. Another well-known and established manufacturer spoken to was hopeful and not at all afraid of more than transient bother by freight rates. This district especially, he held, was now so well supplied with railroads as soon to ask no favors of the great lines controlled in the North. Birmingham has railway connection with the coast east and west and with the Tennessee River on the north, and the manufacturers are now strong enough to build railroads of their own.

The market is still dull, with little offerings in expectation of better prices some time within ability to hold. The rolling mills are not sanguine, though every department of the business is busy. Foundries and shops appear to have plenty to do. No. 1 Foundry is held at from \$12.50 to \$13. Some Gray Forge sold the other day at \$11.45.

Mary Pratt Furnace, which went out of blast to enlarge from a 40-ton to a 75-ton plant, will blow in early in May.

The money situation is greatly improved over this time last year. There is a good demand, and it is going at easy rates. Bankers say business generally was never on a more solid and comfortable basis than now.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 8, 1889.

**Pig Iron.**—There have been but few, if any, new features developed in the local market for Pig Iron during the past week. The current business has been mainly confined to the filling of small orders for both Forge and Foundry grades, mainly the former. Buyers, as a class, are disposed to be extremely conservative, unwilling to anticipate wants, but running close to supply on hand, and this inactivity helps to produce the end they desire, with some indications of success. Sellers, however, are making little effort to sell, predicting a more confident feeling and higher prices in the fall, and expecting no decline, now that prices have about reached the productive cost price. However, a few sales made during the week indicate a lower basis, 1000 tons Mottled having been sold at \$12.25, and 1000 tons Gray Forge at \$13, cash. Smaller amounts have been sold at 25¢ above these prices. No. 1 Southern Foundry Iron has been held firmly at \$15, but buyers are unwilling to pay this rate, and at the close there is an intimation that this rate could be shaded. It is reported that some round lots have been sold recently, but particulars are wanting. The following are the approximate prices current here at the close, for cash, f.o.b.:

### Foundry.

Southern Coke, No. 1 (new classification).....	\$15.00 @ \$15.50
Southern Coke, No. 2 (new classification).....	14.50 @ 14.75
Southern Coke, No. 3 (new classification).....	13.75 @ 14.25
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

### Forge.

Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	12.25 @ 12.50
Gray Forge.....	13.00 @ 13.25

### Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

**Manufactured Iron.**—There has been a light demand for almost all kinds of Manufactured Iron, both mills and foundries being lightly supplied with orders, and an easy time has prevailed.

**Nails.**—There has continued to be a moderate jobbing demand, which has been readily met at previous prices; 12d @ 40d sell at \$1.95 @ \$2 keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.60 keg.

**Old Material.**—There have been freer offerings of Old Rails, and only a moderate demand, at \$20 @ \$20.50, spot. Old Wheels have remained dull, and are nominally quotable \$18 @ \$18.50, spot cash.

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, April 8, 1889.

There are indications of an early improvement in the general iron trade; some large contracts for Wrought-Iron Pipe have been placed during the past week, which will to that extent stimulate the demand for Pipe Iron; and this, it is probable, will be followed by an improvement in the regular Merchant Iron trade. There is a very fair volume of business now, the complaint being chiefly in regard to prices, which are so low as to afford little or no margin for profit. While but few of the mills are running full, they are nearly all in operation, and the indications are that there will be a still better demand as the season becomes more advanced.

Mr. James Callery, president of the Pittsburgh and Western Railroad, and a well-known business man of this city, died suddenly of apoplexy on Friday last. The name of Mr. H. W. Oliver, of Oliver Bros. & Phillips, has been mentioned to succeed Mr. Callery as president of the Pittsburgh and Western Railroad. Mr. Oliver rendered valuable service to the road some years ago when it was in close quarters. The name of Mr. John W. Chalfant, of Spang, Chalfant & Co., is also mentioned in connection with the vacant presidency. The Pittsburgh and Western Railroad gives Pittsburgh an additional outlet both East and West, and is in direct communication with the Shenango and Mahoning Valley Iron districts.

**Pig Iron.**—There has been no important change in the situation during the past week; brokers continue to report business as being as dull as ever, but they are hopeful of an early change for the better. Forge Irons are 25¢ per ton lower than a week ago, while Foundry grades and Bessemer remain unchanged. Furnacemen generally are not disposed to press the market, but there are always those whose financial necessities compel them to sell at the best price they can get, as it is the only way of raising the money, which they must have. The indications are that there will be an increased consumption soon, and with a falling off in production, the outlook is favorable for a better market. Furnacemen say there is no money in the business in the present condition of affairs, and it is probable furnaces now in blast will blow out as soon as they get through with existing contracts. It is the opinion of well-informed operators that prices cannot possibly go much lower, and that with anything like an improvement in the demand the market will stiffen up again. We quote prices as follows:

Neutral Gray Forge.....	\$14.00 @ \$14.25, cash
White and Mottled.....	13.00 @ 13.75, "
All-One Mill.....	15.00 @ 15.50, "
No. 1 Foundry.....	18.50 @ 17.00, "
No. 2 Foundry.....	15.50 @ 16.00, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal.....	24.00 @ 27.00, "
Bessemer Iron.....	16.50 @ 16.75, "

**Manganese.**—Sales of 80 % Ferromanganese at \$59.50 @ \$60; and 20 % Spiegel at \$30 @ \$31.

**Muck Bar.**—There appears to be a little more inquiry, but prices remain unchanged; we continue to quote at \$26.50 @ \$27, cash. May or June delivery could not be bought at prices quoted, as makers generally are not disposed to sell very far ahead.

**Manufactured Iron.**—There is no change to note in the situation as regards the regular Merchant Iron trade; business continues light, while prices show no improvement, being unsatisfactory and unsettled. We continue to quote first quality Iron upon a basis of 1.70¢ @ 1.75¢ for Bars, 60 days. 2 % off for cash; Old Rail Iron can, of course, be had considerably below prices quoted. There is an improved demand for Skelp Iron, contracts

for several thousand tons having been placed during the past week upon a basis of 1.65¢ for Grooved and 1.90¢ for Sheared. The mill at Milvale, formerly owned by Graff, Bennett & Co., has been started up by a syndicate of the creditors of the firm in question, and will be run chiefly on Skelp Iron.

**Nails.**—There is no improvement to note, and not much prospect of any; the Cut Nail appears to have been pretty well supplemented by the Wire Nail. Carnegie, Phipps & Co. are increasing their capacity at their works at New Brighton, Pa., for making Wire Nails, while the Cut Nail makers, both here and at Wheeling, are doing next to nothing. We continue to quote combination rates for the latter, \$1.90 for 12d @ 40d, 60 days, 2 % off for cash.

**Wrought-Iron Pipe.**—We can report a considerably increased volume of business within the past week, orders for some 15,000 tons of Line Pipe having been placed, and what is equally as encouraging is that the prices agreed upon at New York on the 20th of last month are being faithfully maintained by makers. It looks now as if the demand for Pipe was likely to turn out a good deal better than generally expected. In addition to gas and oil fields now being opened up there will be a good deal of Pipe wanted in the older districts. We repeat former quotations. Discounts on Black Butt-Welded Pipe 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Casing, all sizes, 62½ %; Boiler Pipes, 62½ %; Two-inch Tubing, 13¢ per foot, net; Line-Pipe, 8-inch, 90¢ per foot net; 6-inch, 53¢; 3-inch, 20¢.

**Old Rails.**—The market continues quiet, but few offering and not much inquiry. We continue to quote Old Iron Rails at \$23 for American Tees and Old Steel at \$19 for long and \$17.50 @ \$18 for short lengths.

**Steel Rails.**—Heavy sections are still quoted at \$28, cash at mill, for small lots. A large order, it is intimated, would be accepted considerably below price quoted. The new mill of the Allegheny Bessemer Company, recently started, is reported as doing excellent work.

**Billets, Blooms, &c.**—Bessemer Steel Billets and Blooms are still quoted at \$27 @ \$27.50, cash. Nail Slabs, while quoted higher, it is stated can be had at \$29, and there is very little demand for them. Domestic Bloom and Rail Ends, \$17.50 @ \$18.

**Railway Track Supplies.**—Prices remained unchanged. Spikes, 2¢, 30 days; Splice Bars, 1.75¢ @ 1.80¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

**Old Material.**—Demand continues light, while prices remain unchanged. No. 1 Wrought Scrap, \$19 @ \$19.50, net ton; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross; Cast Borings, \$11 @ \$12; Car-Wheels, \$19.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, April 8, 1889.

**Pig Iron.**—Is moving off about as fast as made, and there is only a slight falling off in the prices that are being realized. The character of the trade is somewhat different to what it was a few months ago. In this respect, instead of large round lots being sold for deliveries in the long future, the demand seems to be for smaller lots and for immediate shipments, and the Southern Irons are now being so shipped to nearly every local consuming point through the North and West. The rates of freight that have been published from time to time in the columns of *The Iron*

Age have afforded small consumers facilities for ordering direct from the furnaces, and they have in a great many instances availed themselves of it. The fact is that many Northern and Western consumers are now looking to the Southern Iron districts for their main supply, and are gradually being weaned from Irons made North, and during the last two or three months many of the Eastern founders are assuming this position in their purchases. There are a few of our Southern stacks that are turning out a quality of Foundry Iron that seems to be a greater favorite with many consumers than any of the Irons made in the North, and as it can generally be bought from 50¢ to \$1 per ton cheaper than the Northern Iron, it is, of course, purchased in preference. A question of great interest with all our Southern manufacturers is the entire sympathy that is being manifested by all the railroad lines with them, and there is hardly an instance but what producers receive on application a rate but what is entirely satisfactory to any point named, be it East, West, North or South, where they find a market for their goods. Notwithstanding many of these rates in some instances may be considered low, to such an extent is the increased incidental and necessary freight and travel that is being attracted over the lines by reason of these increased industries that there is not a line South but whose net earnings grew or increased each month from 25 to 50 % more this year than they were last.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, April 10, 1889.

**American Pig.**—Some of the leading makers and agents report an increased business, but other sellers still report the market very dull. Northern standard Irons can be readily bought at \$17.50 @ \$18, and some Southern Foundry Iron is offered under \$17 for No. 1. It is true that some of the Iron thus offered is a new brand, but that does not materially alter the situation, since when one brand of Southern Pig is introduced another comes up. The sharpest competition is at New England points, some of which can be reached by Southern makers within 25¢ of the cost of putting the Iron into New York harbor. We quote Northern standard brands, tidewater delivery, \$17.50 @ \$18 for No. 1 Foundry; \$16.25 @ \$17 for No. Foundry, and \$15 @ \$15.25 for Gray Forge.

**Structural Iron and Steel.**—We quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

**Bar Iron.**—We quote: Carload lots on dock, half extras, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Re-fined, 1.7¢ @ 2¢.

**Steel Rails.**—The market is very quiet, and only minor sales have been made by Eastern mills during the past week, with comparatively little business pending and prices unchanged at \$27 @ \$27.50 for large lots. In the West a sale is reported of 10,000 tons delivered at Toledo, Ohio, 4000 tons going to Chicago mills and 6000 tons to the new Pittsburgh mill.

**Scrap Iron.**—The market for Scrap is inactive, some business in a small way being done at about the following prices: No. 1 Scrap, \$20 @ \$21, for carload lots, delivered; Turnings, \$13 @ \$14, for cargo lots, do.; Cast Scrap, \$15.50 @ \$16, do., and Horseshoes, \$23 @ \$23.50.

**Wire Rods.**—Only small sales of For-

eign Rods are recorded, among them the Acid Rods alluded to in former issues. We continue to quote \$41.25 @ \$41.50 for Foreign.

**Old Rails.**—The market is very quiet, with little offering, and a very light demand. Any effort to sell would result in a lowering of values, \$22.50 being the best bid obtainable for large lots. It is stated that there are 6000 tons of Old Rails waiting for a market, in the Southwest, 4000 tons in Pittsburgh, 2500 tons in Maryland and 2500 in New Jersey.

## Financial.

Accounts respecting the general business situation are somewhat conflicting, it being too frequently necessary to make abatements, whatever view is taken of the general outlook. The volume of trade is restricted in several directions and the margin of profit is satisfactory only in occasional instances. Collections, too, are inclined to drag, and as regards most of the heavy commodities business is being done on a falling market. In wheat there was a break on Monday, both in New York and Chicago, with free sellers and little support, but exporters remained quiet. Provisions are weak and lower. With dry-goods jobbers the busy season is over. Coffee is steady; sugars are firm, but business is hardly as active. The purchase in San Francisco of the American Sugar Refinery by Havemeyers & Elder is a strong addition to the power of the Sugar Trust on the Pacific Coast. The American Refinery has a capacity of 250,000 pounds daily. The east-bound movement from Chicago by rail shows a heavy falling off, largely due to the opening of the water routes. The main line on the Welland Canal opened 16th inst. Cheerful accounts are received of the progress of wheat seeding in the West. In Southern Minnesota and Southern Dakota about 30 per cent. of the wheat is in the ground. Winter wheat has been vastly improved by recent rains.

The Stock Exchange market was more active and strong until Monday, with prices higher for a few leading properties and some improvement in the general list. Burlington and Quincy was bought on the announcement that it is to have a representation in the Atchison's new directory. The Gould specialties were all pretty firm. St. Paul was especially affected by the confirmation of the report that the net earnings for the first quarter of the current year showed an increase of over \$1,000,000. The bank statement caused a partial reaction. On Monday stocks were influenced by a weaker tone in London, and there was some selling of Missouri Pacific and of New England. There was also a sharp bear attack, but news of the offering of nearly \$3,000,000 bonds at prices within the Treasury limit encouraged renewed buying. On Tuesday the market was feverish and lower in the early trade, with Atchison, Topeka and Santa Fe weakest, but it was steady in the afternoon, gradually growing stronger, and closed generally firm. Referring to operations upon the London Stock Exchange last week, the cable says: "Buying was largely promoted by the formation of investment trust companies, the public zeal for which is rapidly reaching a mania. The total number of trusts formed in 1888 was 15, with a capital of £9,500,000. Already this year 19 have been floated, with a capital of £25,075,000, and more are announced.

United States bonds were quoted as follows:

U. S. 4s, 1891, registered.....	108
U. S. 4s, 1891, coupon.....	108
U. S. 4s, 1897, registered.....	128½
U. S. 4s, 1897, coupon.....	128½
U. S. currency 6s.....	120

Sterling exchange is firm, but dull, with rates at \$4.87½ @ \$4.89½, near to the gold exporting point. Money is easier in Lon-

don, with a prospect that the Bank of England rate will be reduced to-day. A special Paris Cable to J. & W. Seligman & Co. says that the financial atmosphere has cleared up. Money is offered in abundance at low rates.

Richard Croker was appointed Chamberlain of the city of New York.

The city of New York is in the market for a 40 years' loan of \$9,000,000 with which to pay for parks recently acquired in the new district, offering 2½ % per annum. The Secretary of the Treasury made a new departure on Saturday by buying a large quantity of 4 % bonds at 129. The Secretary will continue to give preference in his purchases to 4½ % bonds, although at the same time he will not pay more than 108 for them. The depositary balance, for which the Treasury holds bonds as security, is now being reduced only at the rate of about \$1,000,000 per month. One year ago the denotaries held \$62,000,000 of public money. In March it was reduced below \$48,000,000. Official calculations of the money circulation of the United States show the amount of outstanding currency to be greater now by \$37,000,000 than one year ago, and greater by about \$85,000,000 than two years ago, the total being \$1,406,481,000.

Contending in favor of an anti-discrimination bill now before the Pennsylvania Legislature, Andrew Carnegie, in an address before that body on Monday evening, denounced the Pennsylvania Railroad Company in unsparing terms, that corporation having "stabbed secretly from behind and in the dark" the South Pennsylvania scheme, regardless of courts and the State constitution.

The weekly bank statement showed a heavy decrease in reserve equal to \$5,040,550, so that the surplus now held is only \$1,407,185. In loans there was a contraction of \$1,200,300. Specie decreased \$3,115,400, and legal tenders decreased \$2,591,100. Deposits decreased \$7,095,800, and circulation increased \$16,800. The position of the banks was regarded as much stronger than the statement would indicate. Money grew more plentiful as the April dividends came out, and the rate of interest soon dropped as low as 2½ % on call. Time loans are easier for 30 days at 3½ %, and the rate for 60 days to four months is 3½ and 4, and round amounts of German money are offered for long-time contracts. Commercial paper is in good demand from out-of-town buyers.

The clearings of the 41 cities last week show an increase of 5.8 % as compared with 1888. New York gained 3.8 %; Boston 7.2, Chicago 10, Philadelphia 16.1, St. Louis 8.2, San Francisco 13.2, Louisville 21.2, Detroit 33.9, Milwaukee 19.5, Cincinnati 13.7, Cleveland 13.5, Minneapolis 11.9, Omaha 25.7, Denver 21.3, Memphis 34.6, Columbus 31, Peoria 11.2. Pittsburgh decreased 0.9.

The Fifth Avenue Bank has bought of the Cornell estate the property on the corner of Forty-fourth street and Fifth avenue for about \$230,000, and the Clinton Bank has removed into its new quarters in the Mercantile Exchange building, Hudson street.

James Brown, formerly head of the banking firm of Brown Brothers, died on Friday at the Murray Hill Hotel, after a brief illness. Mr. Brown was born at Edinburgh, Scotland, in 1818.

The business failures for the quarter just ended are much larger in number than those during the same period last year, 3569, against 3053. The liabilities did not increase in proportion with the number of failures, and the assets are about 50 % of liabilities. During the last few weeks the number of failures has fallen off as compared with a year ago, but comprises several where heavy amounts are involved.

The exports of specie from this port during the week were \$607,600, and the imports \$68,000. Since January 1 the exports amount to \$12,071,000, against \$7,464,000 for the same time last year.

The imports of merchandise at this port during the week were valued at \$11,689,500, and since January 1 the aggregate is \$142,609,000, as compared with \$135,615,500 for the corresponding period last year. Exports for the week were \$7,585,000, making the total since January 1 \$96,221,000, against \$80,094,000 for the same time last year.

## Metal Market.

**Copper.**—Copper gave way in the London market during the week from £40. 10/, Chili Bars, spot, to £39. 15/ yesterday, and futures from £40. 5/ to £39. 10/, with sales of 2800 tons all told. The representatives of our mines are in Paris, and still negotiating with parties interested there. These negotiations may not be brought to a close for another fortnight, when the outstanding bankers' credits expire, and in the meantime the market here will be kept in abeyance till a price can be fixed on Lake Copper to the current consumer. Small lots of Lake have been offered at 15¢ and 15½¢, respectively, for Cokes and Ingots, without finding prompt takers, and Casting brands are sold at 14¢ and under. The Boston Transcript prints a comparative analysis of the annual reports of the five dividend-paying Copper mining companies which report for the year 1888. Quincy doubled its dividends in 1888, paying \$10 ¢ share, against \$5 in 1887; Atlantic paid \$3.50, against \$1.50; Central \$3.50, against \$2; Osceola, \$3, against \$1, and Franklin \$4, against \$1, the total amount disbursed by the five being \$920,000, against \$390,000, an increase of \$530,000, or 135%. Quincy, Franklin and Osceola called slightly on their accrued surplus in order to make these great increases in dividends. The aggregate net surplus of the five companies, after the payment of January or February dividends this year, amounts to \$1,254,852, which is \$33,512 less than at this time last year. It thus seems that the Copper companies made hay while the sun shone in the matter of dividends, the French syndicate enabling them to earn nearly 100 per cent. more on their respective stocks, and to pay 135 per cent. more in 1888 than in 1887. The average price which these companies received for their Copper in 1888 was 15 2-10 cents per pound, against 11 9-10 cents in 1887. During the first eight months of the current fiscal year the domestic export of Ingot Copper amounted to 12,954,461 pounds, against 15,029,917 in 1888.

**Tin.**—A decline took place in the London market since we last reported in spot Tin, from £94. 15/ to £93 yesterday, and in futures from £95. 12/6 to £93. 15/; sales, 1500 tons. The sales effected here during the interval were 20 tons May at 21.25¢ @ 21.30¢; 35 July and 25 August at 21¢, and 25 tons September at 21¢. Outside of the Exchange several hundred tons, in the aggregate, were sold, chiefly to jobbers, at private terms. As per cablegram from Gilfillan, Wood & Co., Singapore, to Mr. Chas. Nordhaus, their agent, 89 Water street, New York, the Straits Settlements shipped this way during the first quarter 1900 tons, against 650 last year, and to England 4850 tons, against 7800. During the first eight months of the current fiscal year the import of Tin into this country reached 22,540,666 pounds, against 19,475,161 in 1888. Straits Tin on the spot closes at 21¢. **Tin Plates.**—At the higher prices ruling, which we reported in our last report, the market has been only moderately active. Import of Tin Plates into the United States

first eight months of fiscal year, 455,044,549 pounds, against 399,225,046 in 1888. February export from England, 33,971 tons, against 28,713 and 23,656 in 1888 and 1887; first two months, 71,749, against 54,910 and 43,966 tons. We quote, large lines, ordinary brands, ¢ box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.75; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.30 @ \$4.40, and Wasters \$4.15 @ \$4.20.

**Lead.**—Sales for the week were restricted to 200 tons Common Domestic at 3.67½¢. The market has relaxed into a dull mood since at 3.65¢ @ 3.70¢. At St. Louis there has been a quiet state of affairs at 3.40¢ @ 3.42½¢.

**Spelter.**—There has been more doing on the spot at 4.65¢. Common Domestic closes at 4.65¢ @ 4.70¢, and Silesian at 5.50¢ @ 5.62½¢.

**Antimony.**—A moderate jobbing demand has prevailed at 12½¢ Hallett, and 13½¢ Cookson.

## New York Metal Exchange.

The following sales are reported:

FRIDAY, April 5.	
35 tons Tin, July	21.00¢
25 tons Tin, August	21.00¢
48 tons Lead, June	3.72½¢
32 tons Lead, May	3.72½¢
SATURDAY, April 6.	
32 tons Lead, July	3.75¢
MONDAY, April 8.	
16 tons Lead, spot	3.67½¢
TUESDAY, April 9.	
16 tons Lead, spot	3.67½¢
25 tons Tin, September	21.00¢
WEDNESDAY, April 10.	
65 tons Lead, May	3.67½¢
49 tons Lead, August	3.75¢

## Coal Market.

The Anthracite Coal market continues in the congested state noticed for some time past, the simple fact being that supplies of Coal are excessive, and despite the efforts to restrict production accumulation goes on at interior points and at tidewater. The principal Coal centers on the lakes are all overstocked. A winter of extraordinary mildness is mainly accountable for the disproportion between supply and demand and consequent derangement of plans for regulating the trade. Under conditions so abnormal prices are not easily maintained. Companies quote only the regular schedule, accepted by common consent. Nevertheless, reports are current of sales at a concession, for which individual operators are supposed to be responsible, but the aggregate of business doing is unsatisfactory, and to say that "the market is dull" fails to describe the real situation. The representatives of the Anthracite carrying corporations in this city last week reduced tolls 10¢ ¢ ton to tidewater and 25¢ to Buffalo on prepared sizes of Schuylkill and Lehigh Coal, 15¢ on Wyoming to tidewater, and 20¢ on Buckwheat to tidewater, from all three regions, to take effect on April 15. The rate on Pea Coal remains unchanged.

Coal freight agents of several Anthracite-carrying roads met on Monday at Bethlehem, Pa., and reduced the tolls on Anthracite Coal as follows: From the Wyoming region to New York, 15¢ ¢ ton on Prepared; 5¢ on Pea and 20¢ on Buckwheat. From the Lehigh region, 10¢ on prepared and 20¢ on Buckwheat to Philadelphia and New York; 25¢ to Buffalo bridges and corresponding reductions to Lake Ontario ports. To Chicago the rate is reduced 50¢ ¢ ton, to take effect April 15.

Quotations for Anthracite Free-Burning, f.o.b., are: Broken, \$3.75; Egg, \$3.90; Stove, \$4.15; Chestnut, \$4. Reading Hard White Ash prices are the same excepting Broken, which is \$3.90, and Egg, \$4. Pea is \$2.30 @ \$2.40; Lump and Steam-

boat, \$4.25. Individual sales are reported as low as 25¢ off for Egg and Broken, and about 35¢ for Stove.

Production for the week was 488,649 tons, an increase of 7000 tons compared with the previous week. Since January 1 the aggregate is 7,378,180 tons, a decrease of 79,000 tons compared with 1888.

Bituminous Coal is quiet and low prices are reported. Philadelphia was surprised by a reduction of 10¢ ¢ ton by the Baltimore and Ohio Railroad, which puts Cumberland Coal at a lower rate than the Clearfield and Beech Creek shipments; Coal was sold as low as \$2.60 alongside. This had a weakening effect on Anthracite steam sizes. Another reduction in the price of Coke has been reported. Furnace Coke has been sold at \$1.10 at some of the ovens, and even at a lower figure.

The Western Anthracite Association have made a reduction of 50¢ ¢ ton for Coal on the docks at Buffalo.

The work of building the Monongahela River Railroad will soon commence, and it is reported that this line, fed by other Coal and Coke lines, will be brought into direct connection with the Baltimore and Ohio line, opening a Coal region as large as the combined Pittsburgh-Connellsville Coal fields.

It is reported that the Lehigh Valley Coal Company will lease the Hillman and Warrior Run Collieries, which together have an annual output of 160,000 tons.

## Imports.

### Hardware, Machinery, &c.

Aukam, Herman & Co., Mach'y, pgs., 20  
Baker, Carl, F., Mdse., cs., 3  
Baker, Hermann & Co., Arms, cs., 46; Ironware, cs., 27  
Clark, G. A. & Bro., Mach'y, cs., 94  
Corbier, Fellows & Co., Mach'y, cs., 16  
Downing, R. F. & Co., Mach'y, cs., 40  
Eastwood Wire Mfg. Co., Mdse., cs., 6  
Field, Alfred & Co., Gun Caps, cs., 7; Mdse., cs., 16  
Godfrey, Chas. J., Arms, cs., 6; Mdse., cs., 5  
Green, E. P., Hdwr., cs., 1  
Hazeltine, Geo., Mach'y, cs., 1  
Hartley & Graham, Mach'y, cs., 10  
Knauth, Nachod & Kuhne, Mach'y, cs., 5  
Kueppers, Otto, Mach'y, cs., 7  
Lau, J. H. & Co., Arms, cs., 6  
Lewis & Conger, Mdse., cs., 3  
Merchants' Despatch Co., Arms, cs., 3  
Newton & Shipman, Files, cs., 7  
Sala, J. & W., Mach'y, pkgs., 1  
Sloane, W. & J., Mach'y, cs., 4  
Schoverling, Daly & Gales, Arms, cs., 13  
Sheldon, G. W., & Co., Mach'y, pkgs., 9  
Schwarzebach, Huber & Co., Mach'y, pkgs., 3  
Sellers, W. B., Mdse., cs., 5  
Taylor, Thos., Mdse., cs., 6  
Werkmann, H., Arms, cs., 30  
Wiebusch & Hilger, Lim., Mdse., cs., 22; Anvils, 72; Vises, 2  
Order, Arms, cs., 14; Ironwork, cs., 7; Mach'y, cs., 3

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 10, 1889.

Prices for Copper have fluctuated during the week according to the character of various reports and rumors circulated with regard to alleged doings of the French banking institutions and mining delegates. Nothing is officially announced or definitely known as to what has actually been accomplished, but it is believed that it has been agreed to restrict the output of the pool. Consumers treat the syndicate like any other seller, and manifest a determination to buy only in a hand-to-mouth way so long as prices are held up by artificial means. Early in the week cash warrants were scarce and the price advanced to £42. 10/. Since then the tendency has been downward, and G.M.B. sold at £39. 10/ yesterday and even a trifle lower.



Shipments and deliveries of Block Tin have been large. Better news from Paris regarding negotiations on matters connected with the Copper situation stimulated speculation and led to an advance to £95. 2/6 early in the week. Since then the effect of the heavy movement has been more pronounced, and prices receded to £92. 10/ for spot and £98 for futures.

In Tin Plate buying has revived and inquiries are more numerous than last week. Prices are showing greater firmness. A large business is looked for at the quarterly meeting on Thursday. The exports last month were 31,000 tons, against 25,000 tons during March, 1888.

Pig Iron warrants declined somewhat under the effect of realizations but subsequently reacted owing to continued active demand for makers' brands and renewed purchases by outsiders. Shipments continue enormous, except to the United States, to which country only 12,400 tons (all descriptions) were exported last month. A further advance is quoted on some brands of Scotch Pigs and on Hematites. The demand for the latter continues exceedingly brisk.

Manufactured Iron has continued active in all districts and prices are strong. Scotch makers have advanced their prices about 5/, and a similar rise is quoted on Staffordshire common bars.

Steel Rails are up 5/ and strong at the advance, with the demand active. Billets and Plates are also in free demand and held higher. There is not much doing in Wire Rods or Slabs, but makers are asking 1/3 @ 2/6 advance.

Old Material is held higher, owing to the strength of the general Iron market, but business does not increase. America is offering no inducement to ship there and Italy is holding off.

Scotch Pig.—Though not as lively as last week, business has been brisk, and prices are strong, with a further advance on some brands.

No. 1 Coltness, f.o.b. Glasgow	56/6
No. 1 Summerlee, " "	56/
No. 1 Gartsherrie, " "	53/
No. 1 Langloan, " "	56/
No. 1 Carnbroe, " "	47/8
No. 1 Shotts, " at Leith	53/6
No. 1 Glengarnock, " Ardrossan	52/8
No. 1 Dalmeilington, " "	46/6
No. 1 Eglinton, " "	45/6
Steamer freights, Glasgow to New York, 3/ @ 5/; Liverpool to New York, 10/.	

**Cleveland Pig.**—The market less active, but prices held very firmly. No. 3 Middlesboro', G. M. B., 39/ prompt.

**Bessemer Pig.**—There has been a large business, and prices are strong at the further advance. West Coast brands, mixed numbers, 50/6, f.o.b. shipping point.

**Spiegeleisen.**—The demand continues fair, and prices are firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

**Steel Rails.**—Makers have advanced prices 5/, and the market continues active. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—A moderate trade passing at former prices. We quote £3. 19/3 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—The market firm and demand fairly active. Bessemer, 2½ x 2½ inch, £4. 6/3, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—A moderate business doing at firm prices. Bessemer, £3. 19/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—Holders are very firm, but the demand is moderate. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap Iron.**—There is little doing and prices are unchanged. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—Prices very firm, but dealings moderate. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin Plate.**—There has been more business and the market is firm. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/9
IC Bessemer Steel, Coke finish	13/6 @ 14/
IC Siemens	14/ @ 14/6
IC Coke, B. V. grade	13/3 @ 13/6
Charcoal Terne, Dean grade	12/6 @ 13/

**Manufactured Iron.**—A fairly active business and the market strong. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d. @ 8 2 6
Common	£ s. d. @ 5 15 0
Staff. Bl'k Sheet, singles	7 12 6 @
Welsh Bars (f.o.b. Wales)	5 2 6 @ 5 5 0

**Copper.**—Moderate purchases only by consumers. Speculation moderately active. The quoted prices were: Bars, £39. 10/ @ £39. 15/ for spot; £39. 7/6 @ £39. 10/ for three months' futures. Best Selected, £47.

**Tin.**—There has been a fairly active trade at rather lower prices. Straits quoted at £92. 15/ @ £93, spot, and £93. 10/ @ £93. 15/ for three months' futures.

**Lead.**—More doing in this line and price firmer. Quoted at £12. 10/ for Soft Spanish.

**Spelter.**—Holders are firmer, but the demand is moderate. Quoted at £17 for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

Franc, Peseta or Lira	19.3
Florin (Netherlands)	10.2
Florin (Austria)	35.9
Wirels (Portugal)	1.08
Wirels (Brazil)	54.6
Mark (Germany)	23.8
Kilogram	2.205
Picul	134

### CHILL.

VALPARAISO, February 1, 1889.—Copper.—After buying 14,843 quintals at \$23.80 @ \$25.90, exporters withdrew from the market altogether pending further developments in Europe. The price of \$24.50 equals £71. 3/ f.o.b., with 35/ steam freight. Coal.—Owing to scarcity English Coal commands 28/ spot, and affords 41/8. Shipments from Australia are liberal, and this sort sells at 30/ @ 31/6. Exchange, 90 days' sight, 29¼d.—Weber & Co.

### EAST INDIES.

PENANG, February 20, 1889.—Tin.—Receipts amounted during the fortnight to 10,500 piculs. Europeans bought 5640, and Chinese 6500. The market meanwhile gave way from \$36.80 to \$36.10 picul. The stock left is held by speculators.—Schmidt, Kustermann & Co.

SINGAPORE, April 4, 1889.—Tin.—There were shipped from the Straits Settlements to the United States during March 550 tons, against 250 in 1888, and to England 900, against 1800; since January 1 to the former respectively 1960, against 650, and to the latter 4850, against 7800.—Gillman, Wood & Co., per cable to Mr. Charles Nordhaus, their agent, 88 Water street, New York.

COLOMBO, CEYLON, February 28, 1889.—Plumbago.—But a moderate amount of activity has prevailed at following rates, in rupees, per ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Export, since October 1, to England, 54,901 cwt.; to Hamburg, 4419; to Antwerp, 3086, and to Bremen, 659; to Holland, 437; to India, 63; to Australia, 88, and to the United States, 58,580, together 122,233, against 111,486 in 1888; 99,235 in 1887, and 81,546 in 1886. Coir Yarn has been steady at 7 @ 12 rupees per cwt., Nos. 1 to 4. Nothing doing in Ebony. Exchange, 6 months' sight, 1/5.—Volkart Brothers to their agent, Mr. John W. Greene, 82 Wall street, New York.

MANILA, April 1, 1889.—Hemp.—May be quoted nominally \$15.50 per picul, against \$8.37½ same date last year, equaling ½ ton, cost and freight, £52, against £30. 8/6. There cleared for the United States since last cable 8000 Bales, against 4000; since January 1 90,000, against 43,000; loading for ditto 14,000, against 15,000; cleared for England since January 1 67,000 Bales, against 104,000; loading for ditto 15,000, against 4000; cleared for all other ports 9000, against 19,000; receipts at all ports since last cable 15,000, against 16,000, and since January 1, 175,000 Bales, against 152,000 last year and 115,000 in 1887. Freight \$7.50, against \$5. Exchange, six months' sight, 3/7¼, against 3/8¼.—Ker & Co., per cable direct to their agent in New York, Mr. Chas. Nordhaus, 88 Water street.

## Recent Tests of Tobin Bronze.

Since our earliest reference to the mechanical properties of Tobin bronze, manufactured by the Ansonia Brass and Copper Company, a number of additional tests have been made, which possess considerable interest. N. O. Olsen, engineer of the Fairbanks department of tests and experiments, reports the following results on 8-inch rounds, varying in diameter from 0.632 to 0.645 inch:

Mark.	Elongation, per cent.	Reduction of area, per cent.	Elastic limit, lbs. per sq. in.	Tensile strength, lbs. per sq. in.
A.....	14.50	34.05	.....	79,200
B.....	12.50	30.57	.....	80,420
C.....	16.25	33.12	.....	79,750
1.....	17.00	35.47	51,990	79,700
2.....	16.25	38.70	55,790	79,690
3.....	14.00	37.61	55,050	78,900

With a view to determining its torsional endurance for steam launch and yacht shafting, test specimens were cut at random from 4-inch hot rolled Tobin bronze rods in stock, and subjected to a torsional test in comparison with the best quality of machinery steel selected by Prof. J. E. Denton, of the Stevens Institute, and tested by him on Thurston's machine. The tensile strength of the steel was 94,550 pounds, and its stretch 36.44 per cent. in 4½ inches length of specimen, having a diameter of ¾ of an inch.

Material.	Diameter.	Load at end of one foot lever.	Twisting in degrees.
		Which strained samples to elastic limit, lbs.	Which ruptured samples, lbs.
		At elastic limit.	At point of rupture.
Tobin bronze.	.500	325	660
	.498	340	625
	.498	320	615
Machinery steel.	.497	330	710
	.498	350	700
	.498	340	725
Average for bronze.		328	633
Average for steel.		340	711

The length of all the specimens was 1 inch.

T. William Harris & Co., No. 44 Broadway, New York, have been awarded the contract for building water-works for the town of Marblehead, Mass. The work includes about 8 miles of pipe and a great deal of difficult ledgework, as the streets are very narrow and the ledge plentiful and hard.

Warren T. Kellogg, of Lansingburg, who was for ten years manager of the Cohoes Iron Foundry and Machine Shop, in Cohoes, has purchased the plant known as the scale property in Lansingburg. This plant was until recently occupied by the Rensselaer Scale Works, now located on Cohoes Island, near the Cohoes and Lansingburg bridge. Mr. Kellogg proposes to use the plant in the manufacture of the Empire portable forges. The work of the Empire Portable Forge Company is now done by contract, some in Cohoes and some in Philadelphia. Mr. Kellogg proposes to unite all these branches of manufacture in the Lansingburg plant as soon as the expiration of existing contracts will permit.

## Hardware.

There is a good deal of complaint in this market in regard to business, the demand at the present time not coming up to expectations and trade being characterized by more or less sluggishness. In a good many lines, especially seasonable goods, there is fair activity, and in some the manufacturers have difficulty in filling orders promptly. The general tone of the market in regard to prices is without important change, and there are remarkably few lines of goods on which revised quotations are issued. Prices, as a rule, are not especially strong, but the close margins on most lines prevent concessions. Collections are rather slow.

### Barb Wire.

In the territory covered by the Eastern manufacturers there is a very satisfactory business doing, and the demand is referred to as in excess of last season's. Prices also are well maintained on a basis of 3.5 cents for carload lots of Galvanized Four-Point, 3.6 cents for 3-ton lots, and 3.8 cents for smaller parcels, with deliveries.

### Cut Nails.

The volume of business in the New York market is now satisfactory, and there is not so much eagerness to sell, the market remaining at \$1.80 for carload lots of Iron Nails, on dock. The pool plan of the Eastern manufacturers is going the rounds for signatures by those who did not attend the Philadelphia meeting.

### Miscellaneous Prices.

Shepard Hardware Company, Buffalo, N. Y., quote their Lightning Freezers and their Giant Lightning Freezers at a discount ranging from 65 per cent. to 65 and 5 per cent.:

#### Lightning Ice-Cream Freezer.

2-quart.....	\$3.75
3-quart.....	4.50
4-quart.....	5.50
6-quart.....	7.00
8-quart.....	9.00
10-quart.....	11.00
14-quart.....	14.00

#### Giant Lightning Ice-Cream Freezer.

14-quart, with clutch and fly-wheel.....	\$30.00
20-quart, with clutch and crank.....	28.00
20-quart, with clutch and fly-wheel.....	28.00

White Mountain Freezer Company, Nashua, N. H., are quoting on their White Mountain Freezers discount 50, 20 and 5 per cent., and on their New Arctic Freezers discount 50, 40 and 5 per cent. The latter Freezer, which has been put on the market this season, is referred to as having been in so much demand that the company have found it difficult to execute orders as promptly as they could wish, but they are rapidly working into better shape, and state that from this time on they will probably be able to fill orders on receipt. Since last season they have increased their facilities by the addition to their plant of a three-story brick building 170 x 36 feet, but still find themselves somewhat cramped for room. They state that they are employing upward of 280 men, and in many departments running extra time, their average monthly production being about 15,000 Freezers.

Goshen Sweeper and Wringer Company, Goshen, Ind., issue circulars describing the Hoozier and the Leader Broadcast Hand Seed Sowers, for which they have an extensive trade in this country and also export large quantities. They are sold at the following prices:

The Hoozier Broadcast Hand Seed Sower, per dozen.....	\$24.00
The Leader Broadcast Hand Seed Sower, per dozen.....	20.00

The Wringer market, besides the animated competition which prevails and the fair business that is doing, has few fea-

tures that call for mention. The prices which are prevailing are regarded as very low and as not justifying concessions beyond the regular quotations without some sacrifice of the quality. The stock of Wringers in the hands of the trade recently purchased at low figures is regarded as considerable.

The manufacturers of Freezers agree in reporting a very satisfactory business, the demand having been in some cases in excess of last year. Prices are, however, slightly lower than those which ruled the past season.

### Items.

Samuel F. Randolph, who has been connected with the firm of J. C. McCarty & Co. and their predecessors for more than 20 years, has resigned his position with them as manager of their financial department, to accept the management of the Commonwealth Rubber Company, of 25 Murray street, New York, a manufacturing corporation just formed. Mr. Randolph takes with him the hearty good wishes of all his friends and associates in the trade for the success of the new company. The officers of the company are: Lewis Roberts, president; S. F. Randolph, treasurer and manager; Addison F. Roberts, secretary.

The firm of Dickinson, Pulliam & Co., of Little Rock, Ark., established in 1879, have been incorporated under the laws of their State as the Dickinson Hardware Company, with a capital of \$50,000, all of which has been subscribed and paid in, and is held by the following parties: W. W. Dickinson, president; Thos. J. Darragh, vice-president, and Jacob Niemeyer, secretary and treasurer. They propose to do a jobbing Hardware and Stove business, and will also work the Machinery business thoroughly. They desire to make connection with some of the leading manufacturers of Saw Mills, Engines, Corn Mills and other lines, and would be glad to have correspondence as to prices, terms, &c.

Among the special notices on page 45 is one in which the Roanoke Mfg. and Investment Company, Roanoke, Va., call attention to the desirability of that point for the establishment of manufactories and the inducements which are offered. We are advised that the company propose to offer to concerns who with good faith and some means locate in that city and engage in the manufacture of staple and marketable goods, privilege and use of an agreed amount of the capital stock of the company, and to make other arrangements presenting financial inducements. The city, we are advised, has grown from 400 inhabitants in 1880 to 15,000 in 1888, and has already a number of manufacturing concerns, including a rolling mill, blast furnace, machine works, planing mills and other factories, a bridge construction and ironworks plant being in course of erection.

Gooch Freezer Company, Cincinnati, Ohio, are this season placing on the market, besides their well-known Peerless and Giant Freezers, the Zero, Pet and Boss Freezers, which are made to supply the demand for cheaper goods.

The Deverall Perfection Mfg. Company, 1 Adams street, Brooklyn, N. Y., illustrate in a leaflet circular their line of Locomotive, Cotton Mill, Bench and other Oilers and Hand Lamps, which, they advise us, they are now making in an improved form, and are in a position to fill orders promptly.

George Chase, 107th street and First avenue, New York, has issued a price list of Arkansas, Washita and other Oil Stones, of which he is manufacturer. Special attention is called to the Green Paper brand

of Washita Stone. It is described as carefully selected with reference to its cutting qualities and as being superior to the ordinary No. 1 Stone, being softer, of more even grain and not liable to glaze with proper usage. His mounted Oil Stones for carving tools and German Razor Hone are also illustrated. Mr. Chase reports that his business has never been better than at present, and refers especially to the activity in export trade.

Palmer Mfg. Company, 290 Pearl street, New York, issue a sheet showing their line of fancy metal goods in brass, copper, white embossed metal, &c. An interesting variety of Trays, Crumb Trays with Brush and Scraper, Match Safes, Tea Kettles, Flue Stops, is thus shown.

In their advertisement on page 64 Sidney Shepard & Co., Buffalo, N. Y., and C. Sidney Shepard & Co., Chicago, Ill., illustrate the Shaker Flour Sifter, which is made under Barler's patent. The special feature of this Sifter is emphasized, namely, that it is operated by one hand.

William Richards, New Harmony, Ind., issues a convenient catalogue of Farm Machinery, Engines, Thrashers, Hullers, Implements and Supplies handled by him. Serviceable information is given in regard to the different machines.

In their advertisement on page 73 Thomas Devlin & Co., Philadelphia, Pa., call attention to the line of Tackle Blocks, Oar Locks, Awning Fittings and other manufactures of their National Hardware and Malleable Iron Works. They also allude to their facilities for furnishing Malleable and Soft Gray Iron and Steel Castings to order.

Markley, Alling & Co., Chicago, Ill., have issued a price current of 32 pages, representing selections of Builders' Hardware, and showing an extensive line of bronze-plated goods.

Wheeler, Madden & Clemson Mfg. Company, Middletown, Conn., have been shut down since the middle of February last, owing to a strike on the part of about one-fourth of their hands. These men were employed in such departments of their works that the company thought it advisable to close down their entire plant. Their Saw factory was, however, put in operation again on the 8th inst., manufacturing being resumed in nearly all departments, and the company are now prepared to fill orders for Hand and Crosscut Saws and kindred goods the same as heretofore. They took advantage of the shut-down to construct and put in operation considerable new machinery, which they refer to as enabling them to greatly improve the quality of their goods, while also giving them increased facilities for their manufacture. The trade will note with satisfaction this resumption of activity on the part of this leading house.

The trade will note with interest the fact that R. H. Dana & Co., 25 Beaver street, New York, have been appointed selling agents for the Douglas Axe Mfg. Company, Boston, Mass., and orders and communications relating to business are referred to them. For some time they have been representing the goods for export, but this arrangement, we understand, gives them the sale of the goods for the home trade also.

An arrangement has been completed by the Nes Chain Mfg. Company, York, Pa., by which Henry Keidel & Co., Baltimore, Md., are appointed their representatives to the Southern trade. In view of the frequent complaints about delay in filling orders the company intend making a special effort to avoid such complaints by manufacturing and storing leading sizes of Chains between the seasons, thus avoiding the subsequent overcrowding of their

order books. They advise us also that as a guarantee of quality they will stamp in bold and legible characters NBS on the ring or hook of the Chains they send out.

In their advertisement on page 63 the Simonds Mfg. Company, 50 Cliff street, New York, illustrate a new design of Register, of which they are making a variety of sizes, as there indicated, alluding also to their Registers, Ventilators, Furnaces, Ranges, &c., which are represented in their catalogues

The Lovell Mfg. Company, Erie, Pa., issue a price list under date March 1, giving quotations on Clothes Mangles, Clothes Wringers, Folding Wash Benches, Delusion, Bonanza and Easy-Setting Choker Mouse Traps, Folding Wire, Erie and Gem Rat Traps, Cork Pullers and Trucks.

The trade will observe on page 47 the announcement of Haydock & Bissell, 15 Park Place, New York, of a peremptory sale, April 18, in which a line of Shelf Hardware, Hammers, Saws, Chisels, Garden Sets, Tacks, Nails, &c., is offered to the trade.

With reference to their strike the Enterprise Mfg. Company, Philadelphia, Pa., make the following formal statement as to its occasion:

#### TO THE HARDWARE TRADE.

We are pleased to announce that we have succeeded in filling our foundry with new molders, and we are now able to fill all orders promptly. Our former molders struck on account of the price we offered to pay for molding a Lawn-Mower Wheel. At this price a good molder could readily earn \$4 per day, and, as this was not satisfactory to a Grievance Committee who appeared to control their actions, after a full discussion of the subject we could not agree, and they struck.

#### Obituary.

Nathan Wilkinson, of Wheeling, W. Va., who died at an advanced age on March 18, was a man of sufficient prominence in the Nail trade for many years to justify extended notice. He was a native of New England, and in his early days was engaged in the manufacture of Steel in Massachusetts. Afterward he was connected with the Whitaker Iron Works, at Elko, Md., and removed to Wheeling in 1855, assisting in the establishment of the Riverside Iron Works, which has since grown to such important proportions. Excepting the period of the Civil War, when he was in the army, Colonel Wilkinson was connected with this company from their foundation up to 1882, when he retired, holding the office of secretary of the corporation at that time. He is described by his associates as one of the most genial and companionable of men, whose motives were founded on the highest principles and who was the soul of honor in all his dealings. He is referred to as having been universally popular, living without a stain and dying without an enemy.

#### Exports.

BY BARK STAR OF THE EAST, MARCH 26, 1889, FOR ADELAIDE, AUSTRALIA.

By W. H. Crossman & Bro.—1170 pounds Nails, 1½ dozen Mangles, 3 gross Polish, 12 dozen Springs, 2 dozen Can Openers, 3 gross Shade Rollers, 3 dozen Wringers, 103 dozen Handles, 254 dozen Handles, 15 Rifles, 12 sets Tools, 10,000 Shells, 30,000 Primers, 1000 Cartridges, 50,000 Cartridges, 5 packages Pumps, 6 gross Axle Grease, 23 dozen Axes, 5 boxes Hardware, 1 gross Lawn Sprinklers, 13 packages Lamp Goods, 1 box Hardware, 20 dozen Snaths, 7 cases Hardware, 3 gross Wicks, 80 pounds Tacks, 4½ dozen Wringers. By Mauller & Quereau.—13 cases Forks, 5 cases Cultivators, 42 cases School Slates, 13 packages Mill Machinery and Parts, 20 dozen Washboards, 1125 pounds Castings, 4 cases Skates, 24 dozen Washboards. By R. W. Cameron & Co.—1649 pounds Manila Cordage.

By Arkell & Douglas.—30 dozen Handles, 1 cask Pumps, 1 case Forks, 3448 pounds Pipe Grease.

By Joseph Dixon Crucible Co.—2195 pounds Crucibles.

By R. W. Forbes & Son.—1 case Hardware, 2 cases Hardware, 35 cases Sewing Machines.

By Strong & Trowbridge.—8 cases Choppers, 1 case Hoes, 5 cases Cartridges and Shells, 2 cases Whetstones, 1 case Brushes, 3 cases Tinware, 1 case Hardware, 1 cask Lampware, 1 case Bolts, 1 case Lanterns, 1 case Hoe Handles, 1 case Rubber Goods.

By Winchester Repeating Arms Company.—223 Guns, 48 sets Tools, 200,000 Primers, 100,000 Cartridges, 35 Cartridge Shells.

By McLean Bros & Rigg.—6 dozen Snaths, 7500 Bolts, 3 dozen Axes, 2 dozen Carpet Sweepers, 6 dozen Metal Polish, 1000 pounds Nails, 3 dozen Scoops, 4 dozen Choppers, 3 dozen Hay Forks, 3 dozen Hay Forks, 1½ dozen Pumps, 282 pounds Oil Stone, 1 dozen Cork Pullers, 2 gross Shade Rollers, 21 dozen Handles, 40 dozen Axes, 2000 pounds Nails, 50 gross Clothes Pins.

By H. W. Peabody & Co.—5 cases Hardware, 1 case Perambulators, 36 dozen Handles, 1 case Firearms, 1 case Hydraulic Machinery, 3 rolls Wire Cloth, 100 feet Leather Belting, 16 cases Hardware, 500 Handles, 18 packages Lampware, 140 cases Hardware, 1 case Stencil Combinations, 917 pounds Wire Cloth, 4 cases Clocks, 12 dozen Blacking, 48 dozen Shade Rollers, 12 dozen Wringers, 44 cases Agricultural Implements, 726 dozen Handles, 15 cases Toys, &c., 48 packages Stones, 360 gross Pencils, 60 gross Axle Grease, 42 cases Perambulators, 451 packages Carriage Ware, 1 case Hardware, 6 packages Hardware, 9 cases Agate Ware, 7 packages Lampware, 1 case Wireware, 9 dozen Wringers, 9 packages Hardware, 3 dozen Hammocks, 6 dozen Money Drawers.

By Collins & Co.—101 dozen Tools.

By Goulds Mfg. Company.—1 case Hand Pumps and Parts.

By Reed & Barton.—204 pounds Plated-Ware.

By Meriden Britannia Company.—3 boxes Plated-Ware, 2 boxes Plated-Ware.

BY SHIP W. H. CONNOR, MARCH 28, 1889, FOR SYDNEY, N. S. W.

By Ansonia Clock Company.—24 boxes Clocks, 59 boxes Clocks, 30 boxes Clocks, 12 boxes Clocks, 9 boxes Clocks.

By Simpson, Hall, Miller & Co.—930 pounds Plated-Ware.

By the Parker & Whipple Co.—84 pounds Clocks, 84 pounds Clocks, 84 pounds Clocks, 168 pounds Clocks.

By Waterbury Clock Company.—6 cases Clocks, 6 cases Clocks, 10 cases Clocks, 5 cases Clocks, 6 cases Clocks.

By Meriden Britannia Company.—2 boxes Plated-Ware, 13 packages Plated-Ware, 14 boxes Plated-Ware.

By Arnold, Cheney & Co.—17 cases Axes.

By Coombs, Crosby & Eddy.—80 dozen Handles.

By J. L. Mott Iron Works.—8847 pounds Stoves.

By Russell & Erwin Mfg. Co.—4 cases Hardware.

By A. S. Lascelles & Co.—25 dozen Washboards, 100 dozen Brooms, 53 packages Carts, 100,000 Primers, 2 gross Whisk Brooms, 2 gross Shovels, 1 dozen Axes, 3 dozen Hoes, 108 pairs Roller Skates.

By Arkell & Douglas.—2 cases Saws, 3 packages Pumps and Parts, 16 dozen Glue, 48 dozen Axle Clips, 9 dozen Hooks, 90 pounds Castings, 2 cases Axes, 140 pounds Castings, 2 cases Carriage-Ware, 1½ dozen Braces, 1 case Traps, 1 case Hardware, ½ gross Shovels, 1 case Harness, 1 case Oil Stoves, 25 packages Hardware, 39 Guns, 36 Sets Tools, 150,000 Primers, 50,000 Metallic Cartridges, 100,000 Paper Shells, 56,000 Loaded Shells, 26 cases Handles, 30 dozen Picks, 15 dozen Boilers, 5 cases Saws, 186½ gross Wicks, 4 packages Pumps, 5 packages Hardware, 22 dozen Wrenches, 2 cases Mallets, 65 dozen Traps, ½ dozen Air Guns, 2802 pounds Hammocks, 6 dozen Handles, 8 cases Tacks, 1 case Rat Traps, 48 dozen Faucets, 2 cases Chimneys, 720 dozen Handles, 44 gross Wicks, 15 dozen Brushes, 50 dozen Hammocks, 23 dozen Axes, 5 cases Braces, 10 Ranges and Parts.

By H. L. Judd & Co.—2 cases Brass Goods.

By Singer Mfg. Co.—571 cases Sewing Machines and Parts, 150 cases Sewing Machine Oil.

By J. A. Gifford.—43 packages Perambulators, Toy Wagons and Parts, 1 package Brushes.

By Cordley & Hayes.—4 crates Refrigerators, 11 packages Indurated Fiber-Ware.

By H. W. Peabody & Co.—275 pounds Wire Cloth, 10 cases Carbons, 55 cases Sewing Machines.

By A. Field & Co.—230 dozen Whips, 10 gross Shade Rollers, 10,000 Cartridges.

By F. B. Wheeler & Co.—90 sets Harness, 3 dozen Toy Wagons, 1 set Hardware, 9 dozen

Axes, 3 dozen Saws, 1 dozen Axes, 48 dozen Handles, 2 dozen Axes, 18 dozen Picks, 4 dozen Axes, 4 cases Clocks, 12 cases Buggies and Parts.

By E. W. Harrison.—1 Spice Mill Pump, 1 Spice Mill, 8 dozen Picks, 16 dozen Hardware, 1 case Emery-Wheels, 1 case Pump Fittings.

By R. W. Forbes & Son.—12 packages Windmills, 2 Hay Presses, 2 Pumps, 85 cases Sewing Machines, 1 package Castings, 1 package Feed Mills, 3 dozen Hose Clamps, 6 dozen Thermometers, 16 packages Fire Arms, 500 boxes Clothes Pins, 1 case Hardware, 5 dozen Axes, 4 cases Hatchets, 1 dozen Hammers, 1 case Pumps, 1½ dozen Saws, 1½ dozen Wringers, 12 dozen Axe Handles, 1 case Hardware, 9 dozen Rake Handles.

By Strong & Trowbridge.—4 cases Plows, 5 cases Axes, 1 case Hardware, 5 packages Lampware, 1 case Hubs and Spokes, 7 bundles Rims, 2 bundles Shafts, 2 boxes Tools, 6 packages Castings, 22 cases Cartridges, 2 cases Emery-Wheels, 59 cases Axes, Picks and Brooms and Handles, 15 packages Lamp Goods, 8 cases Hardware, 12 cases Scales, 4 cases Tacks, 1 case Rivets, 3 cases Nuts and Bolts, 2 cases Tools, 26 packages Washboards.

By R. W. Cameron & Co.—150 Gross Bottle Stoppers, 300 dozen Chimneys, 78½ tons Blue Roofing Slate, 10 boxes Buggies and Parts, 4 boxes Machinery, 12 Tires, 3 boxes Pump Fittings, 25 cases Oils, 2 boxes Forks, 4 boxes Scales, 1 box Trucks, 2 Blowers, 1 box Machinery, 5 cases Rock-Breaking Machinery, 44 Castings, 5 dozen Axes, 50 crates Blacking, 5 cases Hardware, 3 cases Harness, 60 barrels Skewers, 8 Pumps, 1898 pounds Manila Rope, 1 box Saddlery.

By Coombs, Crosby & Eddy.—22 dozen Washboards, 19½ dozen Blocks, 82 dozen Blocks, 40 pairs Row Locks, 3 Mills, 1 Pump, 44 Blocks and Iron Parts, 100 boxes Clothes Pins, 35 dozen Washboards, 36 nests Pails, 1000 Handles, 24 gross Clothes Pins, 6 nests Tubs, 4 gross Wood Spoons, 5 dozen Wringers, 38 dozen Hardware, 1 case Velocipedes and Parts, 374 pounds Oil Stoves, 18 Pumps, 2½ dozen Tools, 22 dozen Wrenches, 2 gross Lemon Squeezers and Graters, 6 dozen Hardware, 12 dozen Lemon Squeezers, 2 dozen Churns, 6 dozen House-Furnishing Goods, 25 dozen Edge Tools, 10 dozen Braces, 6 dozen Wire Cages, 18 dozen Hammocks, 13½ gross Hardware, 48 dozen Tools, 6 dozen Traps, 3 dozen Stepladders, 24 dozen Tools, 6 gross Wire Goods, 6 dozen Washboards, 30 dozen Axes, 1 dozen Lamps, 1000 pounds Iron Bolts.

By McLean Bros. & Rigg.—4 packages Plated-Ware, 3 dozen Fluters, 3 dozen Brushes, 3 gross Lemon Squeezers, 20 kegs Axle Grease, 3 gross Shade Rollers, 3 dozen Pruning Shears, 5 dozen Bells, 12 dozen Lanterns, 1 gross Bicycle Oilers, 4 dozen Braces, 32 dozen School Slates, 4 dozen Meat Choppers, 9 Coffee Mills, 250 feet Hose, 31 dozen Dog Collars, 48 dozen Handles, 2 dozen Plumbs and Levels, 3 dozen Scythes, 8 cases Wire Goods, 30 dozen Rakes, 6 cases Wire Goods, 400 pounds Nails, 6 dozen Transom Lifts, 36 dozen Curry Combs, 3100 Brass Shells, 4 gross Glue, 2 cases Granite-Ware, 87 dozen Hatchets, 20 dozen Picks, 63 cases Guns, &c., 30 Pumps, 50 dozen Locks, &c., 12 dozen Razors, 12 cases Lampware, 20 dozen Hammocks, 6 cases Lampware, 100 gross Clothes Pins, 3 gross Mop-Holders, 9 dozen Hammocks, 3 Boring Machines, 9 dozen Axle Grease, 1 dozen Plumbs and Levels, 11 dozen Axes, 2½ dozen Braces, 7 dozen Axe-Handles, 26 Pumps, 38 dozen Saws, 20 dozen Locks, &c.

By V. Basanta.—6 dozen Hammocks, 4½ dozen Planes, &c., 16 dozen Hardware, 3100 Wheels and Axes, 70 Velocipedes, 12 Velocipedes, 884 dozen Handles, 3000 feet Garden Hose, 36 dozen Handles, 46½ dozen Plated-Ware, 10 dozen Axes, 36 dozen Hoes, 334 Clocks, 18 dozen Thermometers, 5 gross Toy Pistols, 3 gross Toy Pistols, 4 gross Darts, 6 Perambulators, 23 cases Slates, 100 gross Wicks, 96 dozen Plated-Ware, 205 dozen Lamp Goods, 540 dozen Handles.

By Winchester Repeating Arms Company.—500,000 Primers, 130,000 Metallic Cartridges, 3000 Shells, 115 Rifles, 120 sets Tools, 86,000 Metallic Cartridges, 5000 Primers, 53 Guns, 86 sets Tools, 27,000 Metallic Cartridges, 30,000 Shells, 50,000 Primers, 16,000 Loaded Shells, 20,000 Paper Shells, 26,000 Metallic Cartridges, 200,000 Primers, 15 Guns, 50 sets Tools, 1 case Revolvers and Shells, 30 Guns, 65,000 Metallic Cartridges, 20,000 Shells, 4000 Loaded Shells, 60,000 Primers.

By Heatly & Earl.—1 case Steam Injectors, 3 boxes Pumps, 2 boxes Saws, 9 boxes Pumps, 4 cases Emery Machinery, 33 packages Windmills.

By W. K. Freeman.—9633 pounds Axes, 1539 pounds Hardware, 5109 pounds Tackle Blocks, 2570 pounds Tackle Blocks.

By Tower Mfg. Company.—6 cases Toy Pistol Caps, 8 cases Hardware, 24 Iron Wagons, 1 case Tinware.

### Arrangement of Stores.

The store herewith illustrated is owned by A. W. Kueken, and is located at 221 North Clark street, Chicago. It is very handsomely fitted up, and in every respect has been made attractive to customers. It was the first retail Hardware store in Chicago to introduce the electric light.

of a gallery suspended from the ceiling, which is accessible by means of a stairway in the rear. This gallery is an ornamental addition to the store and also serves another purpose in forming an excellent place to hang surplus goods on, such as Bird Cages, &c.

Agricultural Tools are suspended from brackets, instead of resting on the floor.

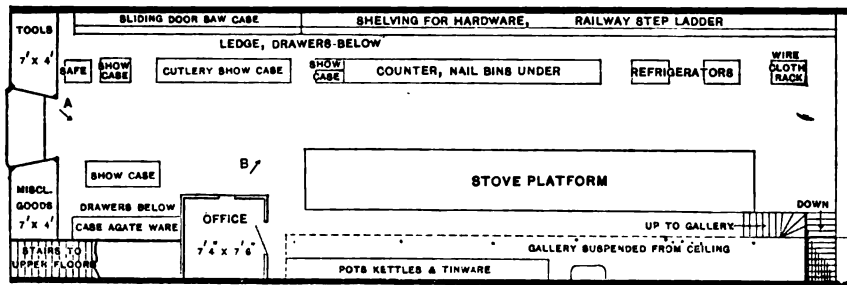


Fig. 328.—Diagram of Store of A. W. Kueken, Chicago.

The walls (wherever exposed) and the ceiling are very artistically papered. The woodwork is of an ornamental character, all of it being finished in cherry. No goods hang from the ceiling. The show-cases are kept brightly polished and in good order, inside as well as outside. The show-windows are made inviting by the display of the newest and freshest goods in original designs, which are often changed. In fact, as the proprietor says, every attempt is made to have this store look as unlike as possible the usual junk shop which is by courtesy called a Hardware store.

One of the show-windows is used for displaying Tools and the other for miscellaneous goods. It will be observed by the ground plan, Fig. 328, that these windows are unusually deep. The Tool window has a platform fitted in the bottom which adds greatly to the effectiveness of the display. It is so made that the back is raised a foot higher than the front. The top is flat, and the front and the sides slope from it to the front and side windows. It is covered with black velvet, which makes a good background for Steel Tools.

The space under the Cutlery showcase is used as a rack for keeping Oil and Gas Stoves. In the Cutlery showcase are arranged a number of jewelers' velvet-lined trays for the display of Pocket Cutlery, &c., which are at night transferred easily to the safe.

The counter, Fig. 329, is located well toward the interior of the store, as the proprietor well remarks that if he can get his customers in far enough to see his full stock they will probably be attracted by something else than just what they went in to purchase. The top of the counter extends several inches over the front, so that ladies will not catch their dresses on the nails in the bins underneath, as they are apt to do when they lean against an ordinary straight counter.

The boxes for Shelf Hardware in this store are all made of tin or sheet iron, with sliding covers. Green paper is pasted on the front of them, and samples of their contents are attached. These boxes are made of various sizes to suit the goods contained in them, and they are usually large enough to hold several small boxes with an assortment of goods, such as Screw Eyes, &c. They were made by Mr. Kueken himself, or in his tinshop, and represent the growth of many years.

The Saw case contains Saws hanging on hooks. Being incased with glass doors they can easily be seen, yet are not exposed to danger of rust.

A railway step-ladder is used to reach the goods on the Hardware side of the store, but the House-Furnishing Goods on the opposite side of the store are reached partly from the floor and partly by means

of these brackets are the ordinary shelf brackets, with an 8 or 10 inch projection. Two of them are screwed to the wall about 2 inches apart. Tools are then slipped into the open space between the brackets, with their handles down. From half a dozen to a dozen Tools of a kind are thus put together. To keep the ends of

have a sliding shelf, about 2½ feet long by 15 inches wide, which can be pulled out to set goods on when they are being examined by buyers. This saves carrying them to a counter.

The Wire Cloth rack, illustrated in Fig. 331, is made of 1½-inch plank, 9½ inches in extreme width. It will hold 20 rolls of Cloth, from 40 inches in width or wider down to 20 inches, or a full assortment of sizes and colors for an ordinary store. It stands 9½ feet high, while the base covered is 29 inches wide by 8 feet deep. The top is 17 inches square. The circles cut for the rolls to rest in are 6 inches in diameter, the mouth flaring to 7 inches to permit the Cloth to be taken out easily. These circles are cut in deep, leaving 2½ inches of thickness to the back of the plank, which allows sufficient strength to support the weight of the Cloth. This rack is braced by cross-pieces, as indicated in the cut, re-enforced by hooks. Hinges are placed on the upper cross-pieces, which enable the rack to be folded flat together at the end of the season and stored away in a smaller space than with the legs stretched as in the cut. Below each roll of Cloth a tab is pasted on the frame giving the width of the Cloth, so that no measuring is necessary at the rack when filling an order. The roll is taken to a counter near by and unrolled when needed, after which it is imme-

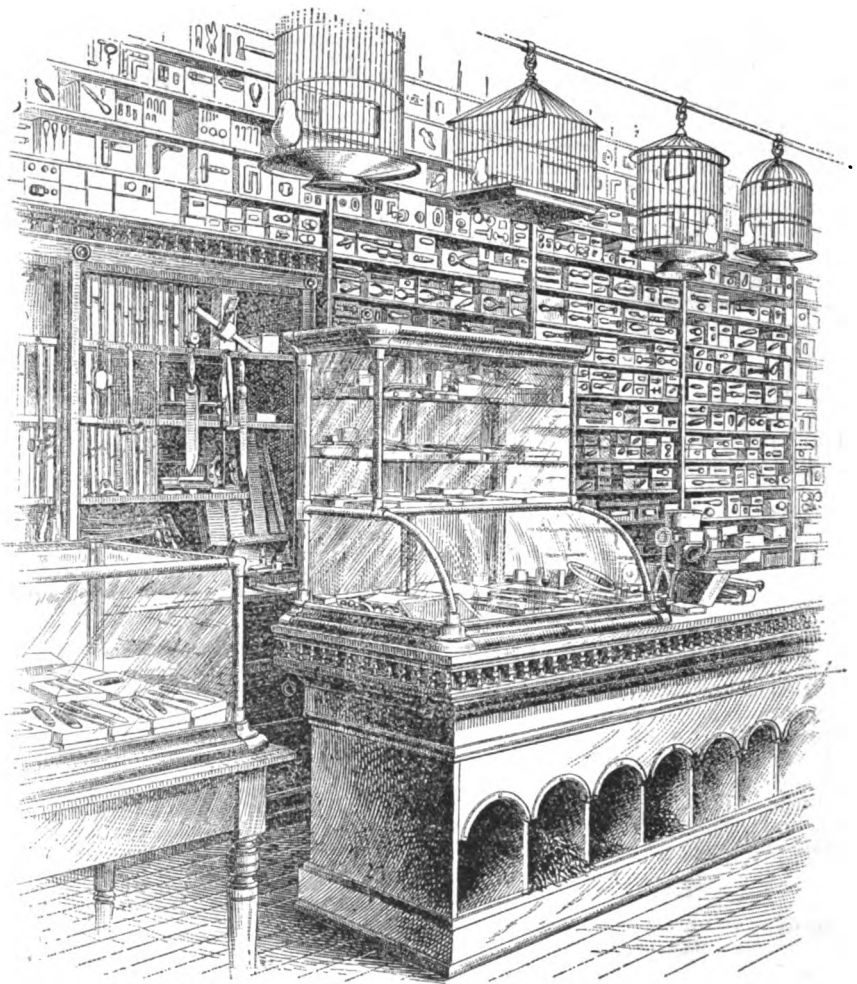


Fig. 329.—Counter, Showcases, &c.

the brackets from spreading and letting the Tools fall a stout piece of wire is used, bent in such shape that the ends drop in the screw holes in the ends of the brackets. Axes and Handles are kept in a rack standing on the floor. This consists of a light framework about 2 feet square, having cross pieces for the Handles to rest against and keep them from falling down.

Under the case in which Agate-Ware is kept it has been found very convenient to

diately restored to the rack. It is thus kept in perfect condition at all times.

The basement of the store is occupied partly as a tinshop, and partly to store Wooden-Ware and other heavy and unsightly goods which would detract from the appearance of the store or take up a great deal of room.

The accompanying illustration, Fig. 332, for which we are indebted to "H. N. B.," Nanticoke, Pa., represents a Horseshoe



rack in connection with a counter, and illustrates a compact and convenient method for handling these goods for retail purposes. The rack is made with 8 x 1 inch strips placed upright flush with the inside face of the counter and a corresponding strip on the other side of the counter. Through holes in these strips round pieces of wood or iron are inserted, on which the Shoes are placed as shown in the cut. It will be observed that the upright strips are placed at different distances, so as to permit of easy access to the goods, and it is suggested that between the first and second from the left the distance should be 7½ inches, and between the second and third 2½ inches.

The men went to work as usual on Monday, but during the day a committee called on the general manager and told him they were authorized to say that unless the reduction notice was taken down they would quit work inside of 24 hours. The manager replied that they would work all of this week at the old wages, therefore he did not see that the question of wages was involved. The men left, and in the course of the afternoon they informed the superintendent that they would not work any longer—the night turn not coming on. The clerks are making up the payroll for last week and Monday of this, and they will be paid in full Wednesday. It might be well to state that \$3.50 is the

"Idaho valleys cannot be excelled by any region east of California for the production of fruit. Several of the orchards in the vicinity of Boise City produce from 25,000 to 40,000 bushels of fruit annually. Several companies have been organized and have secured water rights on the Boise River above and below Boise City. They propose carrying the water by different



Fig. 330.—Office, Shelving, Gallery, &c.

The manner in which the upright pieces are marked with the kind and number of the Shoes will be observed.

#### The Situation at the Columbia Mills.

Some four weeks ago the general manager of the Columbia Iron Company told the mill men that in consequence of the Youngstown mill offering iron at \$1.55, less 2 per cent., to their customers in Baltimore and Philadelphia, the price of puddling and other mill wages would have to be reduced, or else the mill would have to shut down, as they could not compete with these prices (the wages being for puddling \$3.85, and other wages in proportion), but the men did not seem inclined to make any concessions. The next move was on the part of the three mills in Columbia and the Pennsylvania mill at Lancaster to put up a notice in their mills on Saturday, March 23, informing the men that on Monday following two weeks the price of puddling would be reduced to \$3.50, and other mill work in proportion. Nothing was said on the part of the men whether they would accept or not. The Columbia mill, being short of orders, put up a notice on Saturday, March 30, leaving up the other notice, informing the men that owing to a depressed condition of the trade the mill would be closed on the following Saturday indefinitely. The men would be paid their wages in full on the following Tuesday.

outside price paid in Eastern Pennsylvania, except the few mills in Philadelphia, which, on account of high rents and living, pay \$3.85. We have since heard that the men at the Pennsylvania mill at Lancaster have given notice that they would not submit to the reduction, and yesterday the men of the Susquehanna Iron Company, of Columbia, did the same. The men at the Columbia Rolling Mill Company will accept the reduction.

#### Irrigation in the Arid West.

By artificial irrigation the area of tillable land in the great West is making constant inroads on the sterile tract formerly known as the "American Desert," the fact having been demonstrated that even sagebrush lands once considered utterly worthless can be easily made to yield the finest fruits. The new State of Idaho is one of the regions where irrigation has been introduced with surprising success. One of the most prominent farmers in the Boise Valley recently made the following statement: "On 10 acres of our poorest land and with imperfect irrigation I raised 40 tons of red-clover hay; sold 75,000 pounds (1,250 bushels) of onions from 2 acres; potatoes gave 500 bushels to the acre; have raised 1,000 bushels on 2 acres; have also raised 113 bushels of barley on an acre; wheat from 40 to 60 bushels; oats, 100 to 150 bushels; carrots and turnips equally good with potatoes." Another, for some year a citizen of the Territory, says:

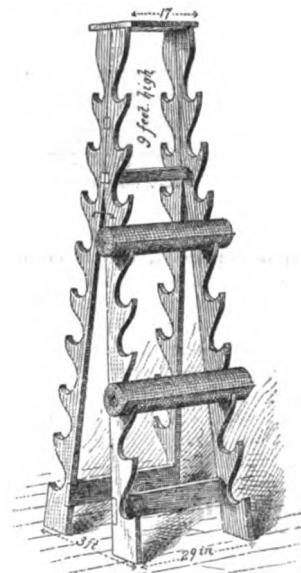


Fig. 331.—Wire-Cloth Rack.

routes across the rich plains traversed by the Idaho Central and the Oregon Short Line railroads." In New Mexico, too, considerable amounts of capital are being introduced by Western men to promote irrigation. The Springer Land Association will build 200 miles of canal in the Red River Valley and vicinity, and several other organizations are engaged in similar enterprises.

Many towns in South Dakota have been desolated by prairie fires. In Sully and Hughes counties the loss of property is computed at \$200,000 and in Lincoln County the losses foot up an equal amount.

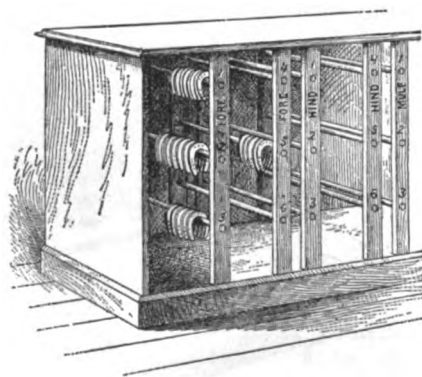


Fig. 332.—Horseshoe Rack in Counter.

The wind at times blew at the rate of 50 or 60 miles an hour, carrying dense clouds of smoke and dust.

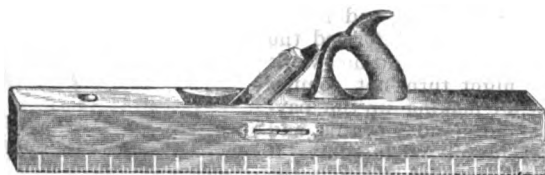
We are indebted to W. H. McGugin, of Olin Furnace, for a copy of the industrial edition of the *Ironton Weekly Republican*, under date of Ironton, Ohio, March 30. One of its features is the description of the well known iron-making plants of Ironton and its vicinity.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have just completed four large Don injection pumps for the Claus Spreckels Refinery at Philadelphia. The pumps are 32 and 26 by 49. They are also building two 16 and 24 by 38 pumps and centrifugal baskets for the same refinery.

### The Phelps Combination Plane.

This article, illustrated herewith, is put on the market by the Auburn Tool Company, Auburn, N. Y. It will be seen that the tool may be used as a plane, level and rule. It is described as made of straight-

vice in opening letters will be appreciated, as well as the fact that its cutting  $6\frac{1}{2}$  inches adapts it to opening ordinary business envelopes. The machine is finished with enameled and nicked parts, and is warranted to work perfectly, the manufacturers stating that they will return the



*The Phelps Combination Plane.*

grained white beech, which is not liable to warp or break where the bit is inserted. The levels are set in plaster-of-paris on the side of the plane, as shown. The plane is made in two lengths, P. C. jack plane, 16 inches long,  $2\frac{1}{4}$  or  $2\frac{1}{2}$  inch iron, and P. C. fore plane, 22 inches long,  $2\frac{1}{4}$ ,  $2\frac{1}{2}$  or  $2\frac{3}{4}$  inch iron. The jack planes are packed 24 in a case, the fore planes being packed 12 in a case. The manufacturers allude to the convenience of this tool for use in odd jobs, avoiding, as it does, the necessity for carrying a level, and also about the house and farm. They refer also to the low price at which it is sold, its cost being but a trifle more than the ordinary plane.

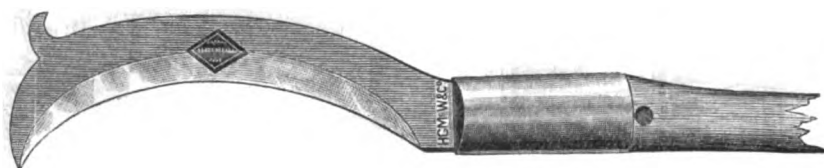
### Envelope Opener.

The Winslow & Curtis Machine Screw Company, Worcester, Mass., are putting on the market the envelope opener represented below. From the illustration it will be seen that there are two cutting knives, one of which is stationary and the other operated by a blow or pressure, their operation being such as to cut a narrow strip from the edge of the envelope placed between them. In connection with the upper knife there is a movable and adjustable gauge which regulates the depth of the cut, and by means of the screws on either side of the handle the position of this gauge is easily regulated. By means of this gauge

money for any cutter sold and for any reason proving unsatisfactory.

### A New Brush Hook.

Horton, Gilmore, McWilliams & Co., of Chicago, have just brought out a brush hook of a special pattern, which is illustrated herewith. Being their own pattern, its manufacture and sale are exclusively controlled by them. It is an improvement on the hook formerly known as the Hamilton or Illinois brush hook. A feature of the original Hamilton hook which was particularly meritorious but had been lost sight of by subsequent manufact-



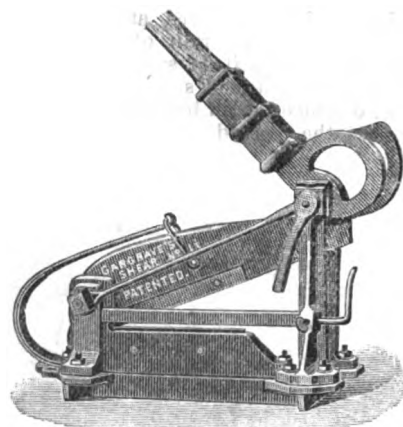
*Brush Hook.*

urers, has also been restored. This feature is the placing of the cutting edge on a line with the bottom of the handle, which prevents it from turning in the hand. It is improved in enlarging the implement both by increasing the length and the thick-

the design of the maker of the original Hamilton hook. The blade is described as being made of the best quality of steel.

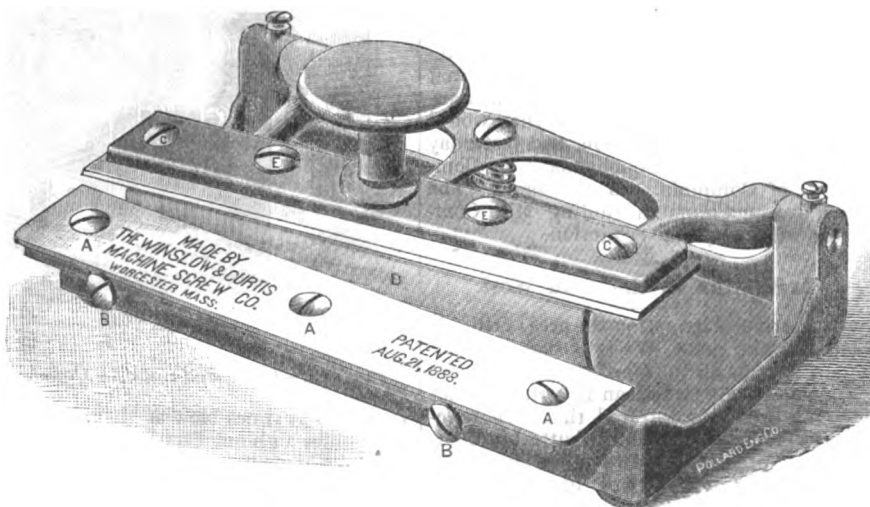
### The Gargrave Shear.

Michael Greenebaum's Sons, of Chicago, are the exclusive manufacturers of a shear of new design, which is adapted to the



*The Gargrave Shear.*

use of blacksmiths and other consumers of bar iron and steel. It is illustrated herewith. The most novel feature about it is the double cam or eccentric at the end of the lever. This is claimed to be the first



*The Winslow & Curtis Envelope Opener.*

the smallest possible margin may be cut from the envelope to prevent all danger of cutting open the letters or their contents, as is frequently done by the insertion of a blade into the envelope. The front cutter may also be adjusted by means of the screws, as shown. The envelope opener will, however, need adjustment in rare cases only, as the cutters are carefully fitted for use before leaving the factory. The convenience of this de-

ness of the blade, making it heavier, and therefore more effective for varied work in trimming hedges, &c. A different curve has also been given to the edge, whereby a draw cut is made with facility. A change has been made in the form of the nib at the edge, whereby a branch can be either pushed or pulled out of the hedge. With this tool the double work can be performed of making a slashing cut or of trimming hedges, which was

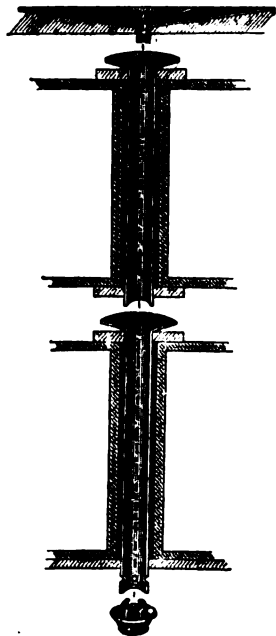
application of a double cam to regulate power. In cutting light iron, or iron so wide as to require the full capacity of the knives, the larger cam is used. In cutting heavy iron, requiring more power, the smaller cam is brought into play. The setting of the cams is effected by means of a small wedge, which is slotted to slip down on the pin on which the cams work. One twist of the nut on the end of the pin loosens the wedge, which can then be put on either side of the cams, as desired, so as to bring either the large or the small one on the shear blade. A device which is shown in the cut holds the bar in place, thus enabling one man to operate the machine. A stiff spring raises the upper blade and opens the shear as soon as the lever is released. The knives are in plain sight, so that the operator can cut to a pencil mark. The tool is made of steel and wrought iron, in four sizes.

### Monroe Bros.' Refrigerators.

Cordley & Hayes, 37 Barclay street, New York, are putting on the market Monroe Bros' indurated fiber-lined and stone-ware-lined refrigerators, for which they claim several points of excellence. Its chief superiority, they say, lies in the fact that indurated fiber is practically indestructible, free from all oxides and poisons, and will not absorb odors and thus become foul. Furthermore, it provides for a perfect circulation of cold air, its drip-pipe cannot overflow and is always clear, and is filled with mineral wool, one of the best non-conductors of heat in use.

The circulation of dry air is accomplished by the arrangement of large ducts beneath the ice racks in the ice chamber, through which the cold air falls into the

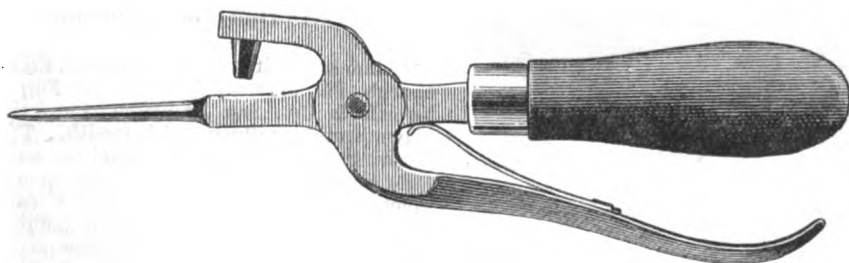
provision compartments, forcing the warmer air through an independent passageway for it in front of the provision compartments to the top of the ice chamber; the warmer upward current of air carries all the vapors and minute particles of food, as fast as they are given off by the provisions, to the top of the ice chamber, where the vapors are condensed and the minute particles of food deposited on the ice and carried off by the drippings from it. The condensation takes place and the deposit is made before the air again reaches the cold-air ducts for the next downward passage, hence the downward current is



Sectional View of Drip Pipe.

always dry and pure. The upward current of air, which carries off the vapors and odors, passing in front of the provision compartments, not through them, prevents any mixture of flavors or tastes, one compartment with another.

Attention is also called to the fact that the refrigerators are built in sections for convenience in handling. A sectional view of the drip-pipe is shown in the cut. The top of the cut shows the sloping bottom of the ice chamber with a small pipe extending about one inch below it and directly over the center of a two-inch pipe with a wide funnel-shaped mouth. Below the latter pipe is a similar one extending through the bottom of the refrigerator. The dotted line extending through the center of the pipes represents the dropping water, which passes through the two pipes without touching them and falls into the cup trap below, which is shown disconnected from the bottom of the pipe. Should straw or sawdust from ice not carefully washed clog the trap it will automatically open and clear the pipe, thus



Combined Belt Punch and Awl.

preventing any overflow of water in the refrigerator. The cut represents the drip in a three-section refrigerator, but the same system of drainage is used in refrigerators built in one or two sections.

#### Combined Belt Punch and Awl.

This article is made by the Humphrey Tool Company, Warren, Mass., and its construction and utility are indicated in

#### Frary's Corkscrews.

The illustrations presented herewith represent corkscrews of special design, which are put on the market by James D.

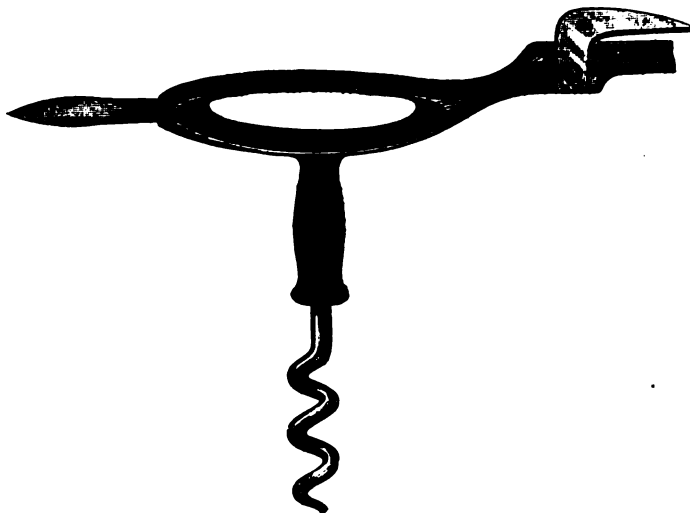


Fig. 1.—Combined Corkscrew, Can-Opener, Ice-Pick, &c.

the illustration given below. It is to be observed that by means of the spring the handles are separated, so that when using the tool as an awl the unused handle is out of the way, while at the same time the combination of the two tools in one is referred to as very convenient. The

Frary, Meriden, Conn. Fig. 1 represents a spiral twist screw with a metallic handle, combined with which is a can-opener and pick or wire-stripper. It is made in two different styles of finish, one of which is full nickel-plate and the other bronzed, with nickel-plated trimmings. Fig. 2 rep-

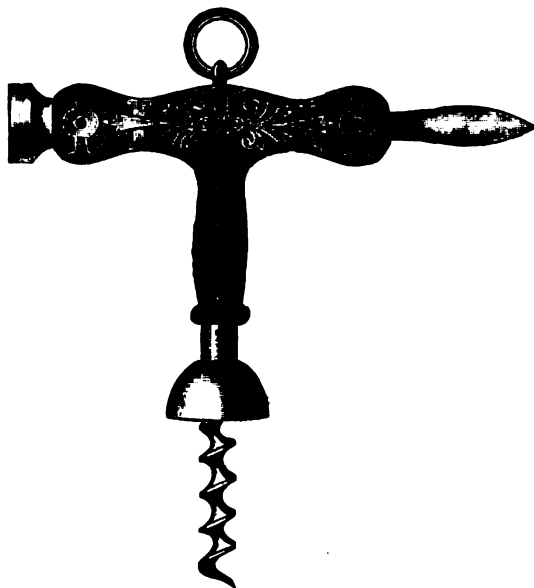


Fig. 2.—Combined Corkscrew, Ice-Pick, Breaker, &c.

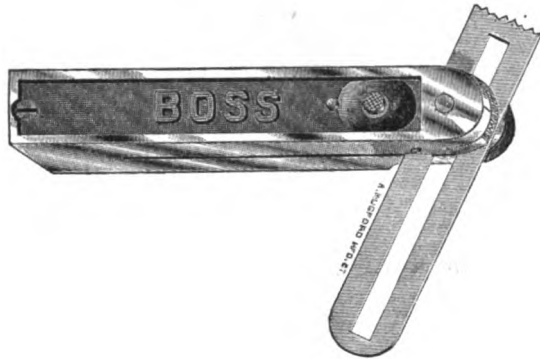
tube is described as made of fine steel, and can be replaced at any time should it become worn or injured. The body of the tool is also made of steel and is finished in japan, the handle being of rosewood. This article is intended especially for belt

resents the Electric self-drawing corkscrew combined with nickel-plated pick or wire-stripper and ice-breaker. Its construction is referred to as such that when inserted in the cork and turned until the revolving bell reaches the cork, a continued turning will extract the hardest cork without difficulty. This article is also made in two styles of finish, one of which is in full nickel-plate and the other bronzed, with nickel-plated screw and trimmings. The quality of the steel in both of these corkscrews and the fact that it is hardened and tempered is alluded to, as well as the convenience of the combinations that are secured.

Many strikes have been started in the building trades in Buffalo, Cleveland and other Western cities within the last few days, and the trouble is expected to culminate about May 1. In St. Louis the bosses refuse to recognize the Carpenters' Brotherhood, so that the prospects of unusual activity at various points are not as good as they were.

### The Boss Flush T-Bevel.

The Hill Bevel Company, North Manchester, Conn., are putting on the market the flush T-bevel illustrated below, which they designate as the Boss. As shown in the cut, the disk in the end of the frame attached to the blade is divided by lines marked with the characters S, W, 8, 6, M, which indicate the following angles:

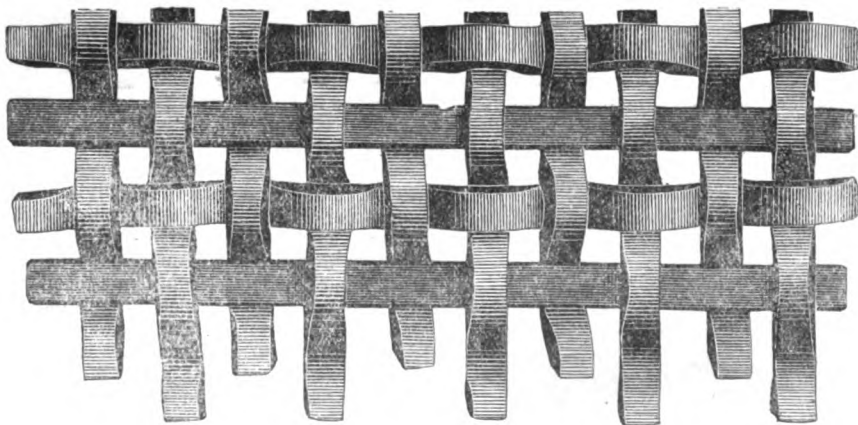


*The Boss Flush T-Bevel.*

S for square; W for window or sill pitch, or angle of  $9^\circ$ ; 8 for octagon or "8-square," or angle of  $22\frac{1}{2}^\circ$ ; 6 for hexagon or "6-square," or angle of  $30^\circ$ ; M for miter, or  $45^\circ$ . To obtain any of these angles the blade is to be moved until the mark on the disk is in line with the center mark on the end of the frame, when the bolt on the side of the frame may be engaged with the blade and lock it in the proper position, when it can be further fastened by screwing down the thumb-nut. When the pressure of the thumb or finger is removed from the bolt, it is brought back to its original position by means of a spring, and the bevel can then be used the same as common bevels.

### Woven Iron.

In a recent number of *The Manufacturer and Builder*, Henry D. Plimssoll, of No. 88 Nassau street, New York, describes a fabric wool of iron bars, of which he is the inventor. The appearance and structure of the fabric is shown in the accompanying engraving. The process by which this result is obtained is exceedingly simple, the bars being corrugated separately, with such a difference between the corrugations of the longitudinal and cross bars as will permit of openings, when they

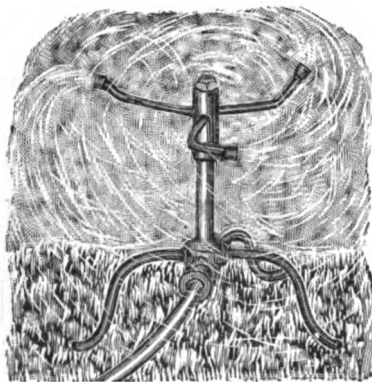


*Woven Wrought Iron.*

are placed in position, for the insertion of straight interlocking bars. Simple as this contrivance is, the fabric, it is said, is exceedingly strong, and, unlike the bridge that "did not bend, but broke," it (the fabric) may bend, but cannot break—it can only be got apart by reversing the process of construction. It is also capable

of being made in a great variety of patterns, varying according to the size, weight and shape of the bars or the size of mesh. The tube iron can also be woven in the same way. The purposes to which it may be applied are as follows: A protection for the interiors and exteriors of private dwellings, prisons, safe deposit vaults, and other public buildings, as a fabric made, say, of one-inch bars, with meshes three inches

square, while not interfering with the light, would require a large amount of cutting before an opening could be made sufficient for the passage of a man's body. For railway cross-ties, as, where several pieces are so arranged, while there would be suffi-



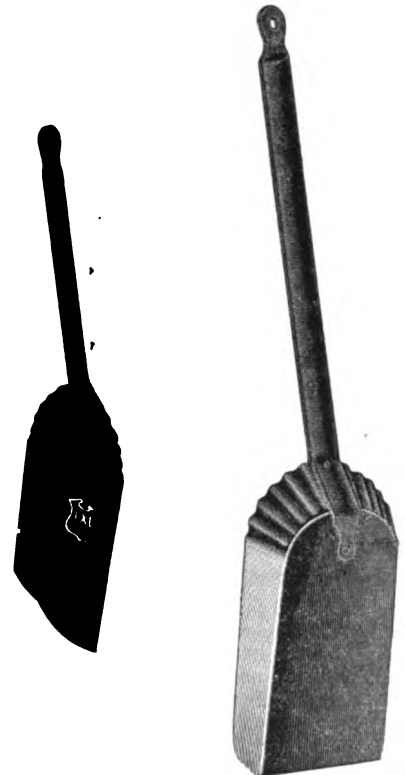
*The California Lawn Sprinkler.*

cient firmness, there would still be sufficient "give" to prevent the wear and tear of tires and rails that is the usual accompaniment of a rigid iron cross-tie. The inventor believes that it would be useful as a netting about ships for protection

of the association is to obtain a classification of freight rates which will put them on an equality with Western manufacturers. At present, they say, the rates eastward are less than half those westward.

### The IXL Double-Handle Steel Stove Shovel.

The accompanying illustrations, Figs. 1 and 2, represent a line of double-handle steel stove shovels put on the market by L. C. Beardsley & Co., Cleveland, Ohio, who have applied for a patent on the same. The special feature of these goods is indicated in the name, the handle being made from two pieces of steel formed in the shape of a half oval, making a hollow oval handle, which is referred to as an easy



*The IXL Double-Handle Steel Stove Shovels.*

fit for the hand. The pieces are riveted together with the scoop between the lower ends, giving strength at the heel of the shovel both inside and outside, where it is most needed. The illustrations give, it will be observed, a bottom and top view of shovels of different patterns and show the manner in which they are formed. These goods are made in three sizes, with sizes of scoop  $5 \times 7\frac{1}{2}$  inch,  $5 \times 8\frac{1}{2}$  inch and  $5\frac{1}{2} \times 9$  inch, and handles 16, 22 and 25 inches long. The durability of the shovels is one of the points on which special emphasis is laid.

### The California Lawn Sprinkler.

Nimick & Brittan Mfg. Company, Pittsburgh, Pa., are manufacturing for Farnsworth & Co., San Francisco, Cal., the lawn sprinkler illustrated herewith. The bearings are described as babbitted with the best Babbitt metal, and the manufacturers claim that they will not leak, wear or get out of order. It is pointed out that the use of this anti-friction metal the sprinkler can be run with very light pressure, and that it will water evenly a space of from 20 to 60 feet square, according to the pressure applied. Its efficiency and economy in the use of water, as well as the low price at which it is offered, are emphasized by the manufacturers.



# CURRENT HARDWARE PRICES.

APRIL 10, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, W 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmied Edge, 1-10's	25¢
E. B. Grnd. Edge, Cent. Fire, 25 & 1-10's	75¢
Double Waterproof, 1-10's	\$1.40
Musket Waterproof, 1-10's	50¢
G. D.	22¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmied	50¢
F. L. Ground	25¢
Cent. Fire Ground	70¢
Dbl. Waterproof	\$1.40
Dbl. Waterproof, in 1-10's	\$1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	\$1.60
Cartridges.	
Rim Fire Cartridges	50¢ & 52¢
Rim Fire Military	15¢ & 22¢
Cent. Fire, Pistol and Rifle	25¢ & 52¢
Cent. Fire, Military and Sporting	15¢ & 52¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., \$1.75	2¢
Primed Shells and Bullets	15¢ & 52¢
B. B. Caps, Round Ball, \$1.75	2¢
B. B. Caps, Con. Ball, Swgd., \$2.00	2¢
Primers	
Berdan Primers, \$1.00	2¢
B. L. Caps (for Sturtevant Shells) \$1.00	2¢
All other Primers, \$1.20	2¢
Shells—	
First quality, 4, 8, 10 and 12 gauge	25¢ & 52¢
First quality, 14, 16 and 20 gauge (\$10 list)	10¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	35¢ & 52¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢ & 52¢
Seibold's Comb. Shot Shells	15¢ & 22¢
Brass Shot Shells, 1st quality	60¢ & 22¢
Brass Shot Shells, Club, Rival, Climax	55¢ & 22¢
I. X. L. 10 and 12 gauge	40¢ & 52¢
"Special" 16 gauge	30¢ & 52¢
"Special" 10 and 12 gauge	40¢ & 52¢
Fowler's Pat.	\$3.25

## Shells Loaded—

A. M. Co. List No. 19, 1887	20¢ & 10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up, \$2.00	
U. M. C. & W. R. A.—B. E., 9 & 10, 2.30	
U. M. C. & W. R. A.—B. E., 7 & 8, 2.60	
U. M. C. & W. R. A.—P. E., 11 up, 3.10	
U. M. C. & W. R. A.—P. E., 9 & 10, 4.00	
U. M. C. & W. R. A.—P. E., 7 & 8, 4.00	
Eley's B. E., 11 up	\$1.75
Eley's P. E., 11 up	2.80

## Anvils—

Eagle Anvil, 10¢	20¢ & 20¢
Peter Wright's	94¢
Armstrong's Mouse Hole	24¢
Armstrong's Mouse Hole, Extra 11	\$1.15
Trenton	94¢
Wilkinson's	94¢
J. & Riley Carr, Pat. Solid	11¢ & 11¢
Moore & Barnes Mfg. Co.	33¢ & 45¢
Anvil Vise and Drill—	
Millers Falls Co.	\$15.00
Cheney Anvil and Vise	20¢
Allen Anvil and Vise	\$3.00

## Apple Parers—

Advance	5¢
Antim Combination	5¢
Baldwin	5.25
Champion	7.25
Eureka, 1888	each 17.00
Family Bay State	12.00
Gem	5.25
Gold Medal	3.75
Hudson's New '88	3.75
Ideal	3.75
Improved Bay State	30.00
Little Star	5.00
Monarch	13.50
New Lightning	5.50
Orion	4.00
Penn.	4.00
Perfection	4.00
Pomona	4.00
Rocking Table	4.00
Turntable	4.00
Victor	4.50
Waverly	4.50
White Mountain	4.25
72	4.25
76	5.75
78	6.50

## Augers and Bits—

Douglas Mfg. Co.	
Wm. A. Ives & Co.	70¢
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55¢
Ives' Circular Lip	50¢ & 10¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension lip	40¢
C. E. Jennings & Co., No. 30	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 32 1/4 quarters, No. 5, \$5; No. 30, \$3.50	20¢
Lewis' Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢ & 80¢
Pugh's Black	20¢
Car Bits	50¢ & 10¢
L. Hommedieu Car Bits	15¢ & 10¢
Forstner Pat. Aug Bits	10¢

## Hollow Augers—

Ives'	25¢ & 10¢
French, Swift & Co.	25¢ & 10¢
Douglas	
Bonney's Adjustable, 1/2 doz \$48	40¢ & 10¢
Ives' Expansive, each \$4.50	20¢ & 10¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢ & 25¢ & 10¢

## Expansive Bits—

Clark's small, \$18; large, \$26	35¢ & 35¢ & 5¢
Ives' No. 4, 1/2 doz \$60	40¢
Swan's	40¢
Steer's, No. 1, \$26; No. 2, \$23	35¢
Steer's, No. 2, \$48	30¢

## Gimlet Bits—

Common	\$2.75 & \$3.25
Diamond	\$1.10
Bee	25¢ & 25¢ & 5¢
Double Cut, Shephardson's	45¢ & 45¢ & 5¢
Double Cut, Ct. Valley Mfg. Co.	30¢ & 10¢
Double Cut, Hartwell's, 1/2 doz	\$5.25
Double Cut, Douglas	40¢ & 10¢
Double Cut, Ives	60¢ & 60¢ & 5¢

## Bit Stock Drills—

Morse Twist Drills	50¢ & 10¢ & 5¢
Standard	50¢ & 10¢ & 5¢
Cleveland	50¢ & 10¢ & 5¢
Syracuse, for metal	50¢ & 10¢ & 5¢
Syracuse, for wood (wood list)	30¢ & 30¢ & 5¢
Williams' or Holt's, for metal	50¢ & 10¢ & 10¢
Williams' or Holt's, for wood	40¢ & 10¢

## Ship Augers and Bits—

L'Hommedieu's	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Watrous	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's Ship Auger Pat'n Car Bits	15¢ & 10¢ & 15¢ & 10¢ & 5¢

## Awl Hafts—

Sewing, Brass Per. 1/2 gr. \$3.50	45¢ & 10¢
Pat. Sewing, Short, 1/2 doz	40¢ & 10¢
Pat. Sewing, Long	1/2 doz \$1.20
Pat. Peg, Plain Top, 1/2 doz	\$10.00
Pat. Peg, Leather Top, 1/2 doz	\$12.00

## Awls, Brad Sets, &c—

Awls, Sewing, Common	1/2 gr \$1.70, 35¢
Awls, Should. Peg, 1/2 gr \$2.45, 40¢ & 40¢ & 10¢	
Awls, Pat. Peg, 1/2 gr \$3.45, 40¢ & 40¢ & 10¢	
Awls, Shouldered Brad, 2.70 1/2 gr	35¢
Awls, Handled Brad, 1.75 1/2 gr	45¢
Awls, Handled Scratch 1/2 gr, \$7.50, 35¢ & 10¢	
Awls, Socket Scratch, 1/2 doz, \$1.50, 25¢ & 30¢	

## Awl and Tool Sets—

Aiken's Sets, Awls and Tools	
No. 20, 1/2 doz \$10.00	55¢ & 10¢
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9	25¢ & 25¢ & 10¢
Miller's Falls Adj. Tool Hds.	25¢
No. 1, \$12; 2, \$18	
Henry's Combination Hart	1/2 doz \$6.50
Brad Sets	
No. 42, \$10.50; No. 43, \$12.50	70¢ & 10¢ & 5¢
Stanley's Excelsior	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50	30¢ & 10¢

## Axes—

### Makers' and Special Brands—

First quality	1/2 doz \$6.00 & \$6.50
Others	1/2 doz \$5.50 & \$5.75

## Axle Grease—

Fraser's	Keg 1/2 doz, 1/2 doz 5¢
Fraser's, in boxes	1/2 gr \$7.50
Dixon's Everlasting, in bxs.	1/2 doz 1 lb
Dixon's Everlasting	1 lb \$2.50; 2 lb \$3.00
Lower grades, special brands	10-lb pails, ea. 85¢
	1/2 gr \$5.50 & \$7.00

## Axles—

No. 1	4¢ & 4¢, No. 2 5¢ & 5¢
Nos. 7 to 14	55¢ & 5¢
Nos. 15 to 18	47¢ & 5¢
Nos. 19 to 22	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5)	
Less than 10 sets	33¢ & 45¢
Over 10 sets	33¢ & 45¢

## Bag Holders—

Sprengle's Pat.	1/2 doz \$18
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## Balances—

Spring Balances	50¢
Common 24-lb	1/2 doz \$1.50
Challinor's Spring Balances	50¢
Challinor's Circular Spring Balances	60¢

## Bells—

### Hand—

Light Brass	70¢ & 10¢ & 70¢
Extra Heavy	60¢ & 10¢
White Metal	60¢ & 10¢ & 10¢
Silver Chime	33¢ & 10¢
Globe (Cone's Patent)	25¢ & 10¢ & 35¢

### Door—

Gong, Abbe's	33¢ & 10¢
Gong, Yankee	45¢ & 10¢
Gong, Barton's	40¢ & 10¢ & 50¢
Crank, Taylor's	25¢ & 10¢
Crank, Brooks	60¢ & 10¢ & 25¢
Crank, Cooke's	10¢

Crank, Connel's	20¢ & 10¢
Lever, Sargent's	60¢ & 10¢
Lever, Taylor's Bronzed or Plated	net
Lever, Taylor's Japanned	25¢ & 10¢
Lever, R. E. M. Co.'s	50¢ & 10¢ & 25¢
Pull, Brook's	50¢ & 10¢ & 25¢
Pull, Western	25¢ & 10¢

## Cow—

Common Wrought	60¢ & 10¢
Western	70¢ & 10¢
Western, Sargent's list	20¢ & 10¢
Kentucky, "Star"	70¢ & 10¢
Dodge, Genuine Kentucky	70¢ & 70¢ & 10¢
Texas Star	50¢ & 10¢ & 50¢ & 10¢ & 5¢
Call	40¢ & 10¢ & 5¢
Farm Bells	1/2 doz 3¢ & 3¢ & 4¢
Steel Alloy Church and School Bells	40¢

## Bellows—

Blacksmiths'	50¢ & 10¢ & 60¢
Molders'	40¢ & 40¢ & 10¢
Hand Bellows	40¢ & 10¢ & 50¢

## Belting, Rubber—

Common Standard	70¢ & 10¢
Standard	70¢ & 10¢ & 5¢
Extra	60¢ & 5¢ & 60¢ & 10¢
N. Y. B. & P. Co., Carbon	60¢ & 10¢ & 5¢
N. Y. B. & P. Co., Diamond	50¢ & 10¢

## Bench Stops—

Morrill's	1/2 doz \$9.50
Hotchkiss's	1/2 doz \$6, 10¢ & 10¢ & 10¢
Weston's, No. 1, \$10; No. 2, \$6	25¢ & 10¢ & 5¢
McGill's	1/2 doz \$3

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension, Barber's	1/2 doz \$15.00
Ives, 1/2 doz \$20.00	60¢ & 5¢ & 60¢ & 10¢
Diagonal	1/2 doz \$24.00
Angular	1/2 doz \$24.00

## Blind Adjusters—

Domestic	1/2 doz \$3.00, 33¢ & 45¢
Excelsior	1/2 doz \$10.00
Washburn's Self-Locking	20¢ & 20¢ & 10¢

## Blind Fasteners—

Macrell's	1/2 doz \$1.00
Van Sand's Sorew Pat., 15¢ 1/2 gr	60¢ & 10¢
Van Sand's Old Pat., 15¢ 1/2 gr	65¢ & 10¢
Washburn's Old Pattern	\$9.00 1/2 gr net
Merriman's	new list, net
Austin & Eddy No. 2008	\$9.00 1/2 gr net
Security Gravity	\$9.00 1/2 gr net

## Blind Staples—

Barbed, 1/2 in. and larger	1/2 doz 7¢ & 8¢ net
Barbed, 1/2 in.	1/2 doz 8¢ & 9¢ net

## Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

## Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.	70¢ & 70¢ & 10¢
Cast Iron Shutter Bolts	70¢ & 70¢ & 10¢
Cast Iron Chain (Sargent's list)	65¢ & 10¢
Ives' Patent Door Bolts	60¢
Wrought Barrel	70¢ & 70¢ & 10¢
Wrought Square	70¢ & 70¢ & 10¢
Wrt Shutter, all Iron, Stanley's	60¢ & 10¢
Wrt Shutter, Brass Knob	40¢ & 10¢
Wrt Shutter, Sargent's list	60¢ & 10¢
Wrt Sunk Flush, Sargent's list	55¢ & 10¢
Wrt Sunk Flush, Stanley's list	50¢ & 10¢
Wrt B.K. Flush, Com'n	55¢ & 10¢

## Carriage, Machine, &c—

Com. list June 10, '84	75¢ & 10¢ & 25¢
Genuine Eagle, list Oct. '84	75¢ & 10¢
Phila. pattern, list Oct. '74	75¢ & 10¢
R. B. & W., old list	75¢ & 10¢ & 5¢
Machine, according to size	75¢ & 10¢ & 80¢
Bolt Ends, according to size	75¢ & 10¢ & 80¢

## Tire—

Common, list Feb. 28, '83	70¢
Port Chester Bolt and Nut Company	
Empire, list Feb. 28, '83	70¢
Phila., list Oct. '84	82¢ & 4¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢ & 10¢
American Screw Company	
Norway, Phila., list Oct. 16, '84	75¢ & 10¢
Eagle, Phila., list Oct. 16, '84	80¢
Philadel., list Oct. 16, '84	82¢ & 4¢
Bay State, list Feb. 28, '83	70¢
R. B. & W., Philadel., list Oct. 16, '84	82¢ & 4¢

## Stone and Plow—

Stone	65¢
Plow	60¢ & 5¢
R. B. & W., Plow	55¢

## Borax—

Without Augers	1/2 doz 9¢ & 10¢ & 4¢
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**Cross-Cut Saw Handles—**  
 Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.  
 Boynton's Loop Saw Handles, 50¢. 60¢  
 Champion.....15¢

**Hangers—**  
 Barn Door, old patterns.....80¢10¢10¢70¢  
 Barn Door, New England.....80¢10¢10¢70¢  
 Hamilton Steel Anti-Friction.....50¢  
 Orleans Steel.....50¢  
 Hamilton Wrought Wood Track.....50¢  
 U. S. Wood Track.....50¢  
 Champion.....60¢10¢5¢  
 Rider and Wooster, Medina Yfg. Co.'s  
 List.....70¢  
 Climax Anti-Friction.....60¢  
 Climax Anti-Friction for Wood Track.....50¢  
 Zenith for Wood Track.....50¢  
 Reed's Steel Arm.....50¢  
 Challenge, Barn Door.....50¢  
 Sterling's Improved (Anti-Friction).....50¢10¢  
 Victor, No. 1, \$15.00; No. 2, \$18.50; No. 3, \$18.00.....50¢25¢  
 Cheritree.....50¢10¢  
 Kilder's.....50¢10¢50¢  
 The Boss.....50¢  
 Best Anti-Friction.....60¢10¢  
 Duplex (Wood Track).....60¢10¢5¢  
 Terry's Pat., pair pr. 4 in. \$10.00; 5 in. \$12.00.....50¢5¢50¢10¢  
 Crank's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.....50¢15¢60¢  
 Word Track Iron Clad, pair ft. 10¢.....15¢60¢5¢  
 Carrier Steel Anti-Friction.....50¢5¢50¢  
 Architect, pair set \$6.00.....20¢  
 Eclipse.....20¢10¢  
 Felix, pair set \$4.50.....20¢  
 Richards.....30¢50¢10¢  
 Lane's Steel Anti-Friction.....40¢10¢  
 Ball Bearing Door Hanger.....20¢10¢25¢10¢  
 Warner's Pat.....20¢20¢10¢  
 Stearns' Anti-Friction.....20¢20¢10¢  
 Stearns' Challenge.....25¢10¢25¢10¢10¢  
 Faultless.....40¢40¢5¢  
 American, pair set \$5.00.....50¢10¢  
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....40¢  
 Paragon, Nos. 1, 2 and 3.....40¢10¢  
 Paragon, Nos. 5, 6, 7 and 8.....20¢10¢  
 Crescent.....60¢60¢10¢  
 Nickel, Cast Iron.....50¢  
 Nickel, Malleable Iron and Steel.....40¢  
 Scranton Anti-Friction Single Strap.....30¢  
 Scranton Anti-Friction Double Strap.....40¢  
 Universal Anti-Friction.....40¢  
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....45¢  
 Star.....40¢10¢40¢10¢5¢  
 May.....50¢5¢50¢10¢  
 Barry, \$6.00.....40¢10¢

**Harness Snaps—**  
 See Snaps.

#### Hatchets—

List Jan. 1, 1886.....35¢40¢  
 Isaiah Blood.....35¢40¢  
 Hunt's Shingling, Lath and Claw.....40¢5¢  
 Hunt's Broad.....40¢  
 Buffalo Hammer Co.....40¢10¢50¢  
 Hurd's.....40¢10¢50¢  
 Fayette R. Plumb.....40¢10¢50¢  
 Wm. Mann, Jr., & Co.....50¢5¢40¢10¢  
 Underhill Edge Tool Co.....40¢5¢40¢10¢  
 Underhill's, Haines and Bright.....30¢  
 C. Hammond & Son.....40¢10¢50¢  
 Simmons.....40¢10¢50¢  
 Peck's.....40¢10¢40¢10¢5¢  
 Kelly's.....50¢50¢  
 Sargent & Co.....50¢  
 Ten Eyck Edge Tool Co.....40¢10¢40¢10¢5¢  
 Collins.....10¢

#### Hay and Straw Knives—

Lightning, Mfrs'. price pair doz \$18.00, 25¢  
 But jobbers frequently give extras.  
 Wadsworth's.....40¢75¢40¢10¢  
 Carter's Needle.....pair doz \$11.50 to \$12.00  
 Heath's.....14 to 20 in., pair doz \$10.00  
 Auburn Hay, Com. and Spear Point.....50¢  
 Auburn, Straw.....40¢  
 Nolin's Hay.....pair doz \$10.00

#### Hinges—

**Wrought Iron Hinges**  
 Strap and T.....75¢5¢75¢10¢  
 Screw Hook and Strap.....(6 to 12 in., pair doz) 30¢  
 (14 to 20 in., pair doz) 35¢  
 (22 to 36 in., pair doz) 20¢  
 Heavy Welded Hook.....(6 to 12 in., pair doz) 30¢  
 (14 to 20 in., pair doz) 35¢  
 (22 to 36 in., pair doz) 20¢  
 Screw Hook and Eye.....(1/4 in., pair doz) \$1.50  
 (1/2 in., pair doz) \$2.45  
 (3/4 in., pair doz) \$3.80  
 Rolled Blind Hinges, Nos. 32 and 34.....50¢10¢  
 Rolled Blind Hinges, Nos. 232 and 234.....50¢10¢  
 Rolled Plate.....70¢10¢  
 Rolled Raised.....70¢10¢  
 Plate Hinges (8, 10 & 12 in., pair doz) 5¢  
 "Providence" over 12 in., pair doz 4¢  
**Spring Hinges—**  
 Gear's Spring and Blank Lists.....40¢  
 Union Spring Hinge Co.'s list, March, 1886.....20¢  
 Acme and U. S.....30¢  
 Empire and Crown.....20¢  
 Hero and Monarch.....50¢  
 American, Gem, and Star, Japanized 20¢  
 American, Gem, and Star, Bronzed, net  
 Oxford, Bronze and Brass.....net  
 Barker's Double Acting.....20¢10¢  
 Union Mfg. Co.....25¢  
 Bommer's.....30¢  
 Buckman's.....15¢20¢  
 Chicago.....30¢  
 Wilcox.....10¢  
 Devore's.....40¢  
 Rex.....40¢  
 Royal.....60¢  
 Reliable.....60¢  
 Champion.....60¢

#### Gate Hinges—

Western.....pair doz \$4.40, 80¢  
 N. E. Reversible.....pair doz \$7.00, 50¢  
 N. E. Reversible.....pair doz \$5.25, 50¢  
 Clark's, Nos. 1, 2, 3.....60¢10¢5¢  
 N. Y. State.....pair doz \$12.50, 50¢  
 Automatic.....pair doz \$12.50, 50¢  
 Common Sense.....pair doz \$4.50, 50¢  
 Seymour's.....40¢10¢  
 Shepard's.....60¢10¢5¢  
 Reed's Latch and Hinges.....pair doz \$12.00, 50¢  
**Blind Hinges—**  
 Parker.....75¢2¢  
 Palmer.....50¢5¢10¢  
 Seymour.....70¢2¢  
 Nicholson.....40¢10¢  
 Huffer.....50¢

Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢5¢80¢  
 Clark's Mortise Gravity.....50¢  
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢75¢10¢5¢  
 Sargent's No. 12.....75¢10¢10¢  
 Reading's Gravity.....75¢10¢75¢10¢5¢  
 Shepard's.....75¢10¢5¢  
 Noiseless.....75¢10¢5¢  
 Niagara.....80¢2¢  
 Buffalo.....80¢2¢  
 Clark's Genuine Pat.....80¢2¢  
 O. S. Lull & Porter.....75¢10¢  
 Acme, Lull & Porter.....75¢10¢  
 Queen City Reversible.....75¢  
 Clark's Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3.....75¢10¢2¢  
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....25¢2¢

#### Hoes—

**Handled—**  
 Garden, Mortar, &c.....85¢  
 Plaster's, Cotton, &c.....85¢  
 Warren Hoe.....80¢  
 Magic.....pair doz \$4.00

#### Eye—

D. & H. Scovill.....20¢  
 Lane's Crescent Planters Pattern.....45¢5¢  
 Lane's Razor Blade, Scovill Pattern.....30¢  
 Maynard, S. & O. Pat.....45¢5¢  
 Sandusky Tool Co., S. & O. Pat.....60¢  
 Hubbard & Co., S. & O. Pat.....60¢  
 Chattanooga Tool Co., S. & O. Pat.....60¢  
 Grub.....60¢60¢10¢

#### Hog Rings and Rings—

Hill's Improved Rings.....pair doz \$4.50  
 Hill's Old Style Rings.....pair doz \$3.00  
 Hill's Tongs.....pair doz \$4.50  
 Hill's Rings.....pair doz \$2.25 to \$2.40  
 Perfect Rings.....pair doz \$1.75 to \$2.00  
 Perfect Rings.....pair doz \$2.50  
 Blair's Hog Rings.....pair doz \$2.60 to \$2.85  
 Blair's Hog Rings.....pair doz \$2.95 to \$3.00  
 Champion Rings.....pair doz \$2.00  
 Champion Rings, Double.....pair doz \$2.25  
 Brown's Rings.....pair doz \$2.00  
 Brown's Rings.....pair doz \$1.25 to \$1.30

#### Holisting Apparatus—

Moore's Hand Hoist, with Lock Brake.....20¢  
 Moore's Differential Pulley Block.....40¢  
 Energy Mfg. Co.'s.....25¢

#### Holders, File and Tool—

Balz Pat.....pair doz \$4.00; 25¢  
 Nicholson File Holders.....25¢

#### Hollow-Ware—

**Iron—**  
 Stove Hollow-Ware.....60¢60¢5¢  
 Ground.....60¢10¢60¢10¢10¢  
 Unground.....60¢10¢60¢10¢10¢  
**Enameled Hollow-Ware—**  
 Maslin Kettles.....60¢10¢  
 Boilers and Saucepans.....40¢5¢  
 Tinned Boilers and Saucepans.....40¢  
 Gray Enameled-Ware.....50¢50¢5¢  
 Maslin Kettles.....60¢10¢60¢10¢10¢  
 Boilers and Saucepans.....40¢5¢  
 Agate and Granite Ware.....25¢  
 Rustless Hollow-Ware.....50¢60¢5¢  
 Galvanized Tea-Kettles.....

Inch.....6 7 8 9  
 Each.....55¢ 60¢ 65¢ 75¢

#### Silver Plated—

4 mo. or 5¢ cash in 30 days.  
 Reed & Barton.....40¢5¢  
 Meriden Britannia Co.....40¢5¢  
 Simpson, Hall, Miller & Co.....40¢5¢  
 Rogers & Brother.....40¢5¢  
 Hartford Silver Plate Co.....40¢5¢5¢  
 William Rogers Mfg. Co.....40¢5¢5¢

#### Hooks—

**Cast Iron—**  
 Bird Cage, Sargent's list.....60¢10¢10¢  
 Bird Cage, Reading.....60¢10¢10¢  
 Clothes Line, Sargent's list.....60¢10¢10¢  
 Clothes Line, Reading list.....60¢10¢10¢10¢  
 Ceiling, Sargent's list.....55¢10¢10¢  
 Harness, Reading list.....55¢10¢55¢10¢10¢  
 Coat and Hat, Sargent's list.....55¢10¢60¢10¢  
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢

#### Wrought Iron—

Cotton.....pair doz \$1.25  
 Cotton Pat. (N. Y. Mallet & Handle Wks.).....30¢  
 Tassel and Picture (T. & S. Mfg. Co.).....50¢  
 Wrought Staples, Hooks, &c.....50¢  
 See Wrought Goods.

#### Wire—

Wire Coat and Hat, Gem, list April, 1886.....45¢  
 Wire Coat and Hat, Miles, list April, 1886.....45¢  
 Indestructible Coat and Hat.....45¢  
 Wire Coat and Hat, Standard.....45¢  
 Belt.....75¢10¢80¢

#### Miscellaneous

Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50  
 Nolin's Grass.....pair doz \$2.25  
 Bush.....55¢60¢  
 Whitetree—Patent.....50¢  
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢  
 Hooks and Eyes—Brass.....60¢10¢10¢  
 Fish Hooks, American.....60¢  
 Bench Hooks.....See Bench Stops.

#### Horse Nails—

Nos. 6 7 8 9  
 Ausable.....25¢ 25¢ 25¢ 24¢ 23¢  
 25¢10¢25¢10¢10¢  
 Clinton, Fin.....24¢ 22¢ 21¢ 20¢ 19¢  
 Essex.....25¢ 25¢ 25¢ 24¢ 23¢  
 25¢10¢25¢10¢10¢  
 Lyra.....25¢ 23¢ 22¢ 21¢ 20¢  
 Snowden.....25¢ 23¢ 22¢ 21¢ 20¢  
 Putnam.....25¢ 23¢ 22¢ 21¢ 20¢  
 Vulcan.....1000 lb in year 15¢  
 Northwest.....25¢ 23¢ 22¢ 21¢ 20¢  
 10¢10¢5¢5¢  
 Globe.....25¢ 21¢ 20¢ 19¢ 18¢ 20¢24¢  
 Boston.....25¢ 21¢ 20¢ 19¢ 18¢ 20¢24¢  
 A. C.....25¢ 23¢ 22¢ 21¢ 20¢  
 25¢10¢33¢45¢  
 C. B. K.....25¢ 23¢ 22¢ 21¢ 20¢  
 25¢10¢33¢45¢  
 Champlain.....25¢ 25¢ 25¢ 24¢ 23¢  
 25¢10¢10¢

New Haven.....25¢ 25¢ 25¢ 24¢ 23¢  
 25¢10¢25¢10¢10¢  
 Saranac.....25¢ 21¢ 20¢ 19¢ 18¢.....30¢10¢  
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢.....10¢10¢10¢  
 Capewell.....25¢ 25¢ 25¢ 24¢ 23¢.....35¢5¢35¢10¢  
 Star.....25¢ 21¢ 20¢ 19¢ 18¢.....10¢10¢10¢12¢4¢  
 Anchor.....25¢ 21¢ 20¢ 19¢ 18¢.....35¢  
 Western.....25¢ 21¢ 20¢ 19¢ 18¢.....40¢10¢  
 Empire Bronzed.....14¢ 7¢  
**Horse Shoes—See Shoes Horse.**

#### Hose, Rubber—

Competition.....75¢10¢75¢10¢5¢  
 Standard.....70¢70¢10¢  
 Extra.....60¢60¢10¢  
 N. Y. B. & P. Co., Para.....30¢10¢  
 N. Y. B. & P. Co., Extra.....50¢  
 N. Y. B. & P. Co., Dundee.....80¢10¢5¢

#### Huskers—

Blair's Adjustable.....pair gr \$8.00  
 Blair's Adjustable Clipper.....pair gr 7.00

#### Indurated Fiber-Ware.

Spittoons, No. 2, pair doz.....\$6.75  
 Basins, Ringed, pair doz, No. 1, \$3.70; No. 2, \$3.10; No. 3.....\$2.70  
 Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), pair doz nests.....\$16.87  
 Kellers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), pair doz nests.....\$8.37  
 Butter Bowls, 15, 17 and 19-inch (3 pieces), pair doz nests.....\$6.75  
 Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), pair set.....\$3.00  
 Dry Measures, 1, 2, 4, 8 and 16 qts. (6 pieces), pair set.....\$2.25  
 See also Pails.

#### Jack Screws—See Screws.

**Kettles—** Spun. Stamped.  
 Brass, 7 to 17 in., pair doz 24¢ 21¢  
 Brass larger than 17 in., pair doz 26¢ 23¢  
 Enameled and Tea Kettles.....See Hollow-Ware.

#### Keys—

Lock Ass'n list Dec. 30, 1886.....50¢10¢  
 Eagle, Cabinet, &c.....33¢42¢  
 Hotchkiss' Brass Blanks.....40¢  
 Hotchkiss', Copper and Tinned.....40¢  
 Hotchkiss' Pad and Cab.....35¢  
 Patchet Bed Keys.....pair doz \$4.00, 15¢  
 Wollensak Tinned.....50¢10¢

#### Knife Sharpeners—

Parkin's.....  
 Applewood Handles.....pair doz \$6.00, 40¢  
 Rosewood or Cocobolo.....pair doz \$9.00, 40¢

#### Knives—

Wilson's Butcher Knives.....25¢30¢  
 Ames' Butcher Knives.....25¢  
 Peter Bros', Butcher, &c.....40¢10¢  
 Nichols' Butcher Knives.....40¢10¢  
 Ames' Shoe Knives.....20¢25¢  
 Ames' Bread Knives.....pair doz \$1.50, 15¢20¢  
 Moran's Shoe and Bread.....20¢  
 Hay and Straw.....See Hay Knives.  
 Table and Pocket.....See Cutlery.  
 Corn, Auburn Mfg. Co. Western Pat.....2.00  
 Corn, Auburn Mfg. Co. Crescent.....\$3.50

#### Knobs—

Door Mineral.....65¢68¢  
 Door Por. Jap'd.....75¢78¢  
 Door Por. Nickel.....\$2.00 to \$2.25  
 Door Por. Plated, Nickel.....\$2.00 to \$2.25  
 Drawer, Porcelain.....60¢10¢60¢10¢10¢  
 Hematite Door Knobs.....40¢10¢50¢  
 Yale & Towne Wood, list Dec. 1885.....40¢  
 Furniture Plain.....75¢ gro inch, 10¢  
 Furniture, Wood Screws.....25¢10¢  
 Base, Rubber Tip.....70¢10¢5¢  
 Picture, Judd's.....60¢10¢10¢70¢  
 Picture, Sargent's.....70¢10¢  
 Picture, Hematite.....35¢5¢  
 Shutter, Porcelain.....65¢10¢  
 Carriage, Jap.....pair gro 80¢, 60¢10¢

#### Ladles—

Melting, Sargent's.....55¢10¢  
 Melting, Reading.....85¢10¢  
 Melting, Monroe's Pat.....pair doz \$4.00, 40¢  
 Melting, P. S. & W.....35¢10¢40¢  
 Melting, Warner's.....30¢

#### Lawn Mowers—

Standard List.....50¢10¢  
 Quaker City.....60¢10¢  
 Enterprise.....60¢10¢

#### Lanterns—

**Tabular—**  
 Plain with Guards, pair doz.....\$4.00 to \$4.25  
 Lift Wire, with Guards.....\$4.50 to \$4.75  
 Square Plain, with Guards.....\$4.00 to \$4.25  
 Sq. Lift Wire, with Guards.....\$4.25 to \$4.50  
 Without Guards, 25¢ pair doz less.

#### Miscellaneous

Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75.....20¢25¢  
**Lemon Squeezers—**  
 Porcelain Lined, No. 1.....pair doz \$6.00, 25¢30¢  
 Wood, No. 2.....pair doz \$3.00, 35¢  
 Wood, Common.....pair doz \$1.70 to \$1.75  
 Dunlap's Improved.....pair doz \$3.75, 20¢  
 Samuels, No. 1, \$5.00; No. 2, \$6.00.....25¢10¢  
 Jennings' Star.....pair doz \$2.50  
 The Boss.....pair doz \$2.50  
 Dean's, Nos. 1, pair doz \$6.50; 2, \$3.35; 3, \$1.90  
 Little Giant.....50¢50¢25¢  
 King.....40¢5¢

#### Lines—

Cotton and Linen Fish, Draper's.....50¢  
 Draper's Chalk.....60¢  
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....25¢  
 Cotton Chalk.....55¢  
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; No. 5, \$3.00; No. 6, \$3.50; No. 7, \$4.00; No. 8, \$4.50; No. 9, \$5.00; No. 10, \$5.50; No. 11, \$6.00; No. 12, \$6.50; No. 13, \$7.00; No. 14, \$7.50; No. 15, \$8.00; No. 16, \$8.50; No. 17, \$9.00; No. 18, \$9.50; No. 19, \$10.00; No. 20, \$10.50; No. 21, \$11.00; No. 22, \$11.50; No. 23, \$12.00; No. 24, \$12.50; No. 25, \$13.00; No. 26, \$13.50; No. 27, \$14.00; No. 28, \$14.50; No. 29, \$15.00; No. 30, \$15.50; No. 31, \$16.00; No. 32, \$16.50; No. 33, \$17.00; No. 34, \$17.50; No. 35, \$18.00; No. 36, \$18.50; No. 37, \$19.00; No. 38, \$19.50; No. 39, \$20.00; No. 40, \$20.50; No. 41, \$21.00; No. 42, \$21.50; No. 43, \$22.00; No. 44, \$22.50; No. 45, \$23.00; No. 46, \$23.50; No. 47, \$24.00; No. 48, \$24.50; No. 49, \$25.00; No. 50, \$25.50; No. 51, \$26.00; No. 52, \$26.50; No. 53, \$27.00; No. 54, \$27.50; No. 55, \$28.00; No. 56, \$28.50; No. 57, \$29.00; No. 58, \$29.50; No. 59, \$30.00; No. 60, \$30.50; No. 61, \$31.00; No. 62, \$31.50; No. 63, \$32.00; No. 64, \$32.50; No. 65, \$33.00; No. 66, \$33.50; No. 67, \$34.00; No. 68, \$34.50; No. 69, \$35.00; No. 70, \$35.50; No. 71, \$36.00; No. 72, \$36.50; No. 73, \$37.00; No. 74, \$37.50; No. 75, \$38.00; No. 76, \$38.50; No. 77, \$39.00; No. 78, \$39.50; No. 79, \$40.00; No. 80, \$40.50; No. 81, \$41.00; No. 82, \$41.50; No. 83, \$42.00; No. 84, \$42.50; No. 85, \$43.00; No. 86, \$43.50; No. 87, \$44.00; No. 88, \$44.50; No. 89, \$45.00; No. 90, \$45.50; No. 91, \$46.00; No. 92, \$46.50; No. 93, \$47.00; No. 94, \$47.50; No. 95, \$48.00; No. 96, \$48.50; No. 97, \$49.00; No. 98, \$49.50; No. 99, \$50.00; No. 100, \$50.50; No. 101, \$51.00; No. 102, \$51.50; No. 103, \$52.00; No. 104, \$52.50; No. 105, \$53.00; No. 106, \$53.50; No. 107, \$54.00; No. 108, \$54.50; No. 109, \$55.00; No. 110, \$55.50; No. 111, \$56.00; No. 112, \$56.50; No. 113, \$57.00; No. 114, \$57.50; No. 115, \$58.00; No. 116, \$58.50; No. 117, \$59.00; No. 118, \$59.50; No. 119, \$60.00; No. 120, \$60.50; No. 121, \$61.00; No. 122, \$61.50; No. 123, \$62.00; No. 124, \$62.50; No. 125, \$63.00; No. 126, \$63.50; No. 127, \$64.00; No. 128, \$64.50; No. 129, \$65.00; No. 130, \$65.50; No. 131, \$66.00; No. 132, \$66.50; No. 133, \$67.00; No. 134, \$67.50; No. 135, \$68.00; No. 136, \$68.50; No. 137, \$69.00; No. 138, \$69.50; No. 139, \$70.00; No. 140, \$70.50; No. 141, \$71.00; No. 142, \$71.50; No. 143, \$72.00; No. 144, \$72.50; No. 145, \$73.00; No. 146, \$73.50; No. 147, \$74.00; No. 148, \$74.50; No. 149, \$75.00; No. 150, \$75.50; No. 151, \$76.00; No. 152, \$76.50; No. 153, \$77.00; No. 154, \$77.50; No. 155, \$78.00; No. 156, \$78.50; No. 157, \$79.00; No. 158, \$79.50; No. 159, \$80.00; No. 160, \$80.50; No. 161, \$81.00; No. 162, \$81.50; No. 163, \$82.00; No. 164, \$82.50; No. 165, \$83.00; No. 166, \$83.50; No. 167, \$84.00; No. 168, \$84.50; No. 169, \$85.00; No. 170, \$85.50; No. 171, \$86.00; No. 172, \$86.50; No. 173, \$87.00; No. 174, \$87.50; No. 175, \$88.00; No. 176, \$88.50; No. 177, \$89.00; No. 178, \$89.50; No. 179, \$90.00; No. 180, \$90.50; No. 181, \$91.00; No. 182, \$91.50; No. 183, \$92.00; No. 184, \$92.50; No. 185, \$93.00; No. 186, \$93.50; No. 187, \$94.00; No. 188, \$94.50; No. 189, \$95.00; No. 190, \$95.50; No. 191, \$96.00; No. 192, \$96.50; No. 193, \$97.00; No. 194, \$97.50; No. 195, \$98.00; No. 196, \$98.50; No. 197, \$99.00; No. 198, \$99.50; No. 199, \$100.00; No. 200, \$100.50; No. 201, \$101.00; No. 202, \$101.50; No. 203, \$102.00; No. 204, \$102.50; No. 205, \$103.00; No. 206, \$103.50; No. 207, \$104.00; No. 208, \$104.50; No. 209, \$105.00; No. 210, \$105.50; No. 211, \$106.00; No. 212, \$106.50; No. 213, \$107.00; No. 214, \$107.50; No. 215, \$108.00; No. 216, \$108.50; No. 217, \$109.00; No. 218, \$109.50; No. 219, \$110.00

**Melasses Gates—**

Stebbin's Pat.	70¢@70¢7½¢
Stebbin's Genuine.	60¢@10¢10¢
Stebbin's Tinned Ends.	40¢@10¢
Chase's Hard Metal.	50¢@10¢
Bush's.	20¢
Lincoln's Pattern.	70¢@10¢
Wool's.	20¢@10¢

Boss, 7 doz.  
Nos. 1, 77; No. 2, 88; No. 3, 89; No. 4, 110. 60¢@10¢10¢

Money Drawers. 7 doz. \$18¢@20¢

Muzzles—  
Safety. 7 doz. \$3.00, 25¢

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87 70¢@10¢

Wire Nails, Standard Penny. 7 doz. \$2.50@2.60

**Nail Puller—**

Curtiss Hammer.	7 doz. \$9.00
Grant, No. 1.	7 doz. \$30.00, 10¢
Pelican.	7 doz. \$30.00, 25¢
Boss.	7 doz. \$30.00, 30¢
Lightning.	7 doz. \$21.00

**Nail Sets—**

Square.	7 gr., \$4.00@4.25
Round.	7 gr., \$3.25
Cannon's Diamond Point.	7 gr., \$12, 20¢

**Nut Crackers—**

Table (H. & B. Mfg. Co.).	40¢
Blake's Pattern.	7 doz. \$2.00, 10¢
Turner & Seymour Mfg. Co.	50¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square. Hex.	
Hot Pressed.	5.4¢ 5.9¢
Cold Funched.	5.4¢ 5.5¢
In lots less than 100 lb. 7 lb. add 1/4¢; 1-lb boxes, add 1¢ to list.	

**Oakum—**

Government.	7 lb 7¢ @ 8¢
U. S. Navy.	7 lb 6¢ @ 7¢
Navy.	7 lb 5¢ @ 6¢

**Oilers—**

Zinc and Tin.	65¢@65¢10¢
Brass and Copper.	50¢@10¢10¢
Malleable, Hammers Improved, No. 1.	\$3.60; No. 2, \$4.00; No. 3, \$4.40 7 doz.
Malleable, Hammers, Old Pattern, same list.	10¢@10¢10¢
Prior's Pat. or "Paragon" Zinc.	40¢
Prior's Pat. or "Paragon" Brass.	50¢
Olmstead's Tin and Zinc.	80¢
Olmstead's Brass and Copper.	50¢
Broughton's Zinc.	60¢
Broughton's Brass.	50¢

**Packing, Steam—**

Standard.	60¢@10¢60¢10¢10¢
Extra.	50¢@10¢60¢
N. Y. B. & P. Co., Standard.	50¢@10¢5¢
N. Y. B. & P. Co., Empire.	70¢
N. Y. B. & P. Co., Salamander.	70¢
Jenkins' Standard.	70¢ 65¢, 30¢ 80¢, 85¢

**Miscellaneous—**

American Packing.	10¢@11¢ 7 lb
Russia Packing.	14¢ 7 lb
Italian Packing.	13¢@14¢ 7 lb
Cotton Packing.	15¢@17¢ 7 lb
Jute.	7¢@8¢ 7 lb

**Padlocks—****See Locks.****Pails—****Galvanized Iron—**

Quarts.	10 12 14
Hill's Light Weight.	7 doz. \$2.75 3.00 3.25
Hill's Heavy Weight.	7 doz. 3.00 3.25 3.75
Whiting's.	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad.	2.75 3.00 3.25
Fire Buckets.	2.75 3.25 3.50
Buckets, see Well Buckets.	

**Indurated Fibre Ware—**

Star Pails, 12 qt.	7 doz. \$4.50
Fire, Stable and Milk, 14 qt.	7 doz. \$5.85

**Pencils—**

Faber's Carpenters'.	high list 50¢
Faber's Round Gilt.	7 gro \$5.25
Dixon's Lead.	7 gro \$4.50
Dixon's Lumber.	7 gro \$6.75
Dixon's Carpenters'.	40¢@10¢

**Picks—**

Railroad or Adze Eye, 5 to 6.	\$12.00;
6 to 7.	\$13.00. 60¢@50¢10¢

**Picture Nails—**

Brass Head, Sargent's list.	50¢@10¢10¢
Brass Head, Combination list.	50¢@10¢
Porcelain Head, Sargent's list.	50¢@10¢10¢
Porcelain Head, Combination list.	40¢@10¢
Niles' Patent.	40¢

**Pinking Irons— 7 doz 65¢ net****Pipe, Wrought Iron—**

1½ and under, Plain.	list March 23, 1887.
1½ and under, Galvanized.	47½¢
1½ and over, Plain.	87½¢
1½ and over, Galvanized.	87½¢
Boiler Tubes, Iron.	
1½ and under.	57½¢
3 in. to 2½ in.	62½¢
3 in. and larger.	65¢

**Planes and Plane Irons—**

Wood Planes—	
Melting.	50¢@50¢10¢
Bench, First Quality.	60¢@60¢5¢
Bench, Second Quality.	60¢@10¢60¢10¢10¢
Bailley's (Stanley R. & L. Co.).	40¢@10¢

**Iron Planes—**

Bailley's (Stanley R. & L. Co.).	40¢@10¢
Miscellaneous Planes (Stanley R. & L. Co.).	20¢@10¢
Victor Planes (Stanley R. & L. Co.).	20¢@10¢
Steer's Iron Planes.	35¢@35¢5¢
Meriden Mal. Iron Co.'s.	30¢@10¢30¢10¢10¢
Davis's Iron Planes.	30¢@10¢30¢10¢10¢
Birmingham Plane Co.	50¢@50¢5¢
Gage Tool Co.'s Self-Setting.	20¢@10¢
Chaplin's Iron Planes.	40¢@40¢5¢
Sargent's.	30¢@10¢30¢10¢10¢

**Plane Irons—**

Plane Irons.	20¢@10¢
Plane Irons, Butcher's.	\$5.00@5.25 to 2
Plane Irons, Buck Bros.	30¢
Plane Irons, Auburn Tool Co., "This tie"	40¢
Sandusky Tool Co.: Single and Cut.	30¢
Double.	40¢
L. & I. J. White.	25¢

**Pliers and Nippers—**

Button's Patent.	30¢@10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	\$21.00 7 doz
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers, Custar's Nickel Plated.	60¢@5¢
Eureka Pliers and Nippers.	40¢
Russell's Parallel.	25¢
P. S. & W. Cast Steel.	50¢
P. S. & W. Timmers' Cutting Nippers.	add 6¢ dis 10¢
Carew's Pat. Wire Cutters.	20¢
Morris's Parallel.	7 doz. \$12.00. 30¢@5¢
Cronk's 8 in., \$15.00; 10 in. \$21.00.	40¢@40¢5¢

**Plumbs and Levels—**

Regular List.	70¢@10¢70¢10¢10¢
Disston's.	45¢@10¢
Pocket Levels.	70¢@10¢70¢10¢10¢
Davis Iron Levels.	30¢
Davis' Inclometers.	10¢@10¢

**Polish, Metal.**

Prestoline.	20¢@10¢
Krestoline Paste.	33¢@4¢
Gaston's Silver Compound.	33¢@4¢

**Pokes, Animal—**

Bishop's I. X. L.	7 doz. \$6.50
Bishop's O. K.	7 doz. \$5.50
Bishop's Pioneer.	7 doz. \$3.75
Bishop's American.	7 doz. \$3.00

**Poppers, Corn—**

Round or Square, 1 qt.	7 gr. \$12.00@15.00
Round or Square, 2 qt.	7 gr. \$25.00@25.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger.	7 doz. \$36.00. 25¢@10¢
Fletcher Post Hole Augers.	7 doz. \$36, 20¢
Eureka Diggers.	7 doz. \$16.00@17.00
Leed's.	7 doz. \$5.00@9.00
Vaughan's Post Hole Auger.	\$13.00@14.00
Kohler's Little Giant.	7 doz. \$18.00
Kohler's Hercules.	7 doz. \$15.00
Kohler's New Champion.	7 doz. \$9.00
Schneider.	7 doz. \$18.00
Ryan's Post Hole Diggers.	7 doz. \$24.00
Cronk's Post Bars.	7 doz. \$60.00. 50¢@50¢10¢
Gibb's Post Hole Digger.	7 doz. \$30.00. 40¢@40¢10¢

**Potato Parers—**

White Mountain.	7 doz. \$5.00@5.50
Antrim Combination.	7 doz. \$8.00
Hoosier.	7 doz. \$13.50

**Pruning Hooks and Shears—**

Disston's Combined Pruning Hook and Saw.	7 doz. \$18.00, 20¢@10¢
Disston's Pruning Hook.	7 doz. \$12.00. 20¢@5¢
E. S. Lee & Co.'s Pruning Tools.	40¢
Pruning Shears, Henry's Pat.	7 doz. \$3.75@4.00 net
Henry's Pruning Shears.	7 doz. \$4.25@4.50 net
Wheeler, M. & C. Co.'s Combination.	7 doz. \$13.00, 20¢
Dunlap's Saw and Chisel.	7 doz. \$3.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

**Pulleys—**

Hot House, Awning, &c.	60¢@10¢
Japanned Screw.	60¢@10¢
Brass Screw.	60¢@10¢
Japanned Slide.	60¢@10¢
Japanese Clothes Line.	60¢@10¢
Empire Sash Pulley.	50¢@60¢
Moore's Sash, Anti-Friction.	50¢
Hay Fork, Solid Eye, \$4.00; Swivel.	\$4.50. 50¢@10¢50¢10¢5¢
Hay Fork, "Anti-Friction," 5 in. Solid.	\$5.70 50¢
Hay Fork, "F" Common and Pat.	20¢
Hay Fork, Tarbox Pat. Iron.	20¢
Hay Fork, Reed's Self-Lubricating.	45¢
Shade Rack.	45¢
Tackle Blocks.	See Blocks
Moore's Anti-Friction 5 in. Wheel.	7 doz. \$12.00. 40¢

**Pumps—**

Clister, Best Makers.	50¢@10¢60¢
Pitcher Spout, Best Makers.	60¢@10¢60¢
Pitcher Spout, Cheaper Goods.	70¢@10¢5¢

**Punches—**

Saddlers' or Drive, good.	7 doz. 60¢@65¢
Bemis & Call Co.'s Cast Steel Drive.	50¢@5¢
Bemis & Call Co.'s Springfield Socket.	50¢@5¢
Spring, good quality.	7 doz. \$2.50@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check.	40¢
Solid Timmers'.	7 doz. \$1.44. 55¢
Timmers' Hollow Punches.	20¢@25¢
Five Hand Punches.	15¢
Avery's Revolving.	30¢@10¢
Avery's Saw-Set and Punch. See Saw Sets.	

**Rail—**

Sliding Door, Wrt. Brass.	7 lb 35¢. 15¢
Sliding Door, Bronzed Wrt. Iron.	7 ft. 7¢
Sliding Door, Iron, Painted.	7 foot 4¢, 40¢
Barn Door, Light. In.	3¢
Per 100 feet.	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hangers.	
Small. Med. Large.	
Per 100 feet.	\$2.15 2.70 3.25. net
Terry's Wrought Iron.	7 foot. 4¢@5¢
Victor Track Rail.	7¢ 7 foot. 50¢@2¢
Carrier Steel Rail.	7 foot. 4¢
Moore's Wrought Iron.	25¢

**Rakes—**

Cast Steel, Association goods.	65¢
Cast Steel, outside goods.	60¢@10¢70¢
Malleable.	70¢@70¢5¢
Gibbs Lawn Rake.	\$12.00. 50¢
Canton Lawn Rake.	\$9.00, 50¢
St. Madison Prize Bow Brace and Peers.	less
Port Madison Steel Tooth Lawn Rake.	\$6.00. 25¢

**Razors—**

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher,	\$10.00 to 2. 10¢

**Razor Straps—**

Genuine Emerson.	60¢@60¢5¢
Imitation.	7 doz. \$2.00, 20¢@10¢5¢
Torrey's.	20¢
Badger's Belt and Com.	7 doz. \$2.00
Lamont Combination.	7 doz. \$4.00

**Rivets and Burrs—**

Copper.	50¢
Iron, list Nov. 17, '87.	50¢

**Rivet Sets.**

	50¢@10¢
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**Rods—**

Stair, Brass.	25¢@2¢
Stair, Black Walnut.	7 doz. 40¢

**Rollers—**

Barn Door, Sargent's list.	60¢@10¢10¢
Acme Moore's Anti-Friction.	55¢
Union Barn Door Roller.	70¢

**Rope—**

Manufacturers' prices for large lots:	
Manila. 1/4 in. and larger.	7 lb 15¢
Manila. 3/4 in. and larger.	7 lb 16¢
Manila. 1/2 in. and larger.	7 lb 17¢
Manila. 3/4 in. and larger.	7 lb 18¢
Manila. 1/2 in. and larger.	7 lb 19¢
Manila. 3/4 in. and larger.	7 lb 20¢
Manila. 1/2 in. and larger.	7 lb 21¢
Manila. 3/4 in. and larger.	7 lb 22¢
Manila. 1/2 in. and larger.	7 lb 23¢
Manila. 3/4 in. and larger.	7 lb 24¢
Manila. 1/2 in. and larger.	7 lb 25¢
Manila. 3/4 in. and larger.	7 lb 26¢
Manila. 1/2 in. and larger.	7 lb 27¢
Manila. 3/4 in. and larger.	7 lb 28¢
Manila. 1/2 in. and larger.	7 lb 29¢
Manila. 3/4 in. and larger.	7 lb 30¢
Manila. 1/2 in. and larger.	7 lb 31¢
Manila. 3/4 in. and larger.	7 lb 32¢
Manila. 1/2 in. and larger.	7 lb 33¢
Manila. 3/4 in. and larger.	7 lb 34¢
Manila. 1/2 in. and larger.	7 lb 35¢
Manila. 3/4 in. and larger.	7 lb 36¢
Manila. 1/2 in. and larger.	7 lb 37¢
Manila. 3/4 in. and larger.	7 lb 38¢
Manila. 1/2 in. and larger.	7 lb 39¢
Manila. 3/4 in. and larger.	7 lb 40¢
Manila. 1/2 in. and larger.	7 lb 41¢
Manila. 3/4 in. and larger.	7 lb 42¢
Manila. 1/2 in. and larger.	7 lb 43¢
Manila. 3/4 in. and larger.	7 lb 44¢
Manila. 1/2 in. and larger.	7 lb 45¢
Manila. 3/4 in. and larger.	7 lb 46¢
Manila. 1/2 in. and larger.	7 lb 47¢
Manila. 3/4 in. and larger.	7 lb 48¢
Manila. 1/2 in. and larger.	7 lb 49¢
Manila. 3/4 in. and larger.	7 lb 50¢
Manila. 1/2 in. and larger.	7 lb 51¢
Manila. 3/4 in. and larger.	7 lb 52¢
Manila. 1/2 in. and larger.	7 lb 53¢
Manila. 3/4 in. and larger.	7 lb 54¢
Manila. 1/2 in. and larger.	7 lb 55¢
Manila. 3/4 in. and larger.	7 lb 56¢
Manila. 1/2 in. and larger.	7 lb 57¢
Manila. 3/4 in. and larger.	7 lb 58¢
Manila. 1/2 in. and larger.	7 lb 59¢
Manila. 3/4 in. and larger.	7 lb 60¢
Manila. 1/2 in. and larger.	7 lb 61¢
Manila. 3/4 in. and larger.	7 lb 62¢
Manila. 1/2 in. and larger.	7 lb 63¢
Manila. 3/4 in. and larger.	7 lb 64¢
Manila. 1/2 in. and larger.	7 lb 65¢
Manila. 3/4 in. and larger.	7 lb 66¢
Manila. 1/2 in. and larger.	7 lb 67¢
Manila. 3/4 in. and larger.	7 lb 68¢
Manila. 1/2 in. and larger.	7 lb 69¢
Manila. 3/4 in. and larger.	7 lb 70¢
Manila. 1/2 in. and larger.	7 lb 71¢
Manila. 3/4 in. and larger.	7 lb 72¢
Manila. 1/2 in. and larger.	7 lb 73¢
Manila. 3/4 in. and larger.	7 lb 74¢
Manila. 1/2 in. and larger.	7 lb 75¢
Manila. 3/4 in. and larger.	7 lb 76¢
Manila. 1/2 in. and larger.	7 lb 77¢
Manila. 3/4 in. and larger.	7 lb 78¢
Manila. 1/2 in. and larger.	7 lb 79¢
Manila. 3/4 in. and larger.	7 lb 80¢
Manila. 1/2 in. and larger.	7 lb 81¢
Manila. 3/4 in. and larger.	7 lb 82¢
Manila. 1/2 in. and larger.	7 lb 83¢
Manila. 3/4 in. and larger.	7 lb 84¢
Manila. 1/2 in. and larger.	7 lb 85¢
Manila. 3/4 in. and larger.	7 lb 86¢</



<b>Machine-</b>	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
<b>Bench and Hand-</b>	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	50¢ doz \$2.25
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coch and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢40¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢5¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
<b>Scroll Saws-</b>	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	25¢
Barnes' Scroll Saw Blades.....	25¢
<b>Scythe Snaths.....</b>	<b>50¢2¢</b>
<b>Shears-</b>	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning..... See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	50¢ doz \$3.75
Tinners.....	20¢2¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	35¢
First quality C. S. Trimmers.....	50¢60¢10¢
Second quality C. S. Trimmers.....	80¢10¢60¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢10¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	60¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickel, same list.....	60¢
<b>Sheaves-</b>	
<b>Sliding Door-</b>	
M. W. Co., List July, 1888.....	50¢10¢60¢2¢
R. & E., List Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢2¢
Patent Roller.....	60¢10¢2¢
Patent Roller, Hatfield's.....	70¢
Russell's Anti-Friction, List Dec. 1885.....	60¢2¢
Moore's Anti-Friction.....	50¢
<b>Sliding Sauter-</b>	
R. & E. list Dec. 18, 1885.....	60¢10¢2¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
<b>Ship Tools-</b>	
L. & I. J. White.....	20¢2¢
Albertson Mfg. Co.....	25¢
<b>Sheen, Horse, Mule, &amp;c.-</b>	
<b>Horse-</b>	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
<b>Mule-</b>	
Add \$1 per keg to above prices.	
<b>Oz, Wrought-</b>	
Ton lots.....	5¢ doz 9¢
1000 lb lots.....	5¢ doz 9¢
500 lb lots.....	5¢ doz 10¢
<b>Shot-</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.15
Drop, 7 bag, 5 lb.....	.20
Buck and Chilled, 7 25-b bag.....	1.41
Buck and Chilled, 7 5-b bag.....	.34
<b>Shovels and Spades-</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1880.....	20¢
NOTE: Jobbers frequently give 75¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢60¢10¢
Griffith's Solid C. S. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.) 20¢	
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Binns & Co.....	20¢20¢75¢
Hubbard & Co.....	50¢10¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1880.....	30¢
Remington's (Lowman's Pat.) 30¢10¢40¢	
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
<b>Shovels and Tongs-</b>	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
<b>Skeins, Thimble-</b>	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skeins.....	60¢
Utica Turned and Fitted.....	35¢
<b>Sieves-</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sievers.....	50¢ doz \$2.00
Electric.....	50¢ doz \$2.00
Hunter's.....	50¢ doz \$2.00
Smith's Adjustable Sievers.....	50¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	50¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	50¢ doz \$2.00
<b>Sieves, Wooden Rim-</b>	
Mesh 18, Nested, 7 doz.....	70¢ 80¢
Mesh 20, Nested, 7 doz.....	85¢ 100¢
Mesh 24, Nested, 7 doz.....	\$1.00 1.10
<b>Slates-</b>	
School, by case.....	40¢
<b>Snaps, Harness, &amp;c.-</b>	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢2¢
Covert, New Patent.....	50¢2¢
Covert, New R. E.....	60¢2¢
Covered Spring.....	60¢10¢10¢

<b>Soldering Irons-</b>	
Covert's Adjustable, list Jan. 1, 1886.....	35¢2¢
<b>Spoke Shaves-</b>	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
<b>Spoke Trimmers-</b>	
Bonney's.....	50¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00.....	50¢ doz
Douglas.....	50¢ doz \$9.00, 20¢
<b>Spoons and Forks-</b>	
<b>Tinned Iron-</b>	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	50¢10¢
Sliver Plated (4 mos. or 5¢ cash 30 days)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢50¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢60¢
L. Boardman & Son.....	50¢10¢
<b>Miscellaneous.</b>	
Holmes & Edwards Silver Co.....	50¢10¢
No. 67 Mexican Silver.....	50¢10¢
No. 80 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 50 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢50¢5¢
German Silver, Hall & Elton.....	50¢5¢ cash
Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	60¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case 10 lots.....	60¢
<b>Springs-</b>	
Elliptic, Concord, Platform and Half.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
<b>Squares-</b>	
Steel and Iron.....	75¢10¢80¢
Nickel Plated.....	60¢10¢60¢10¢
Try Square and T Bevels.....	20¢
Diastion's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢5¢
<b>Staples-</b>	
Fence Staples, Galvanized.....	Same price
Fence Staples, Plain.....	as B'rb Wire.
See Trl. Rep.	
<b>Steelyards.....</b>	<b>40¢10¢50¢</b>
<b>Stocks and Dies-</b>	
Blacksmith's	
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢15¢40¢
<b>Stone-</b>	
Hindustan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢	
Sand Stone.....	5¢ doz 24¢
Washita Stone, Extra.....	5¢ doz 24¢
Washita Stone, No. 1.....	5¢ doz 24¢
Washita Stone, No. 2.....	5¢ doz 24¢
Washita Slips, No. 1, Extra.....	5¢ doz 24¢
Washita Slips, No. 1.....	5¢ doz 24¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	5¢ doz
Turkey Slips.....	5¢ doz \$1.00, 1.50
Lake Superior, Chase.....	5¢ doz 15¢
Lake Superior Slips, Chase.....	5¢ doz 31¢35¢
Seneca Stone, Red Paper Brand.....	15¢20¢
Seneca Stone, High Rounds.....	5¢ doz 25¢
Seneca Stone, Small Whites.....	5¢ doz \$2.40
<b>Stone Polish-</b>	
Joseph Dixon's.....	5¢ doz \$5.00, 10¢
Gem.....	5¢ doz \$4.50, 10¢
Gold Medal.....	5¢ doz \$5.00, 25¢
Mirror.....	5¢ pro \$5.00, 1¢
Lustro.....	5¢ doz \$4.75
Ruby.....	5¢ doz \$3.75
Rising Sun, 6 gro lots.....	5¢ doz \$5.50
Dixon's Plumbago.....	5¢ doz \$5.00
Boynton's Noon Day.....	5¢ doz \$3.00
Parlor Pride Stove Enamel.....	5¢ doz 3 cans
Yates' Liquid, 2 3 5 10 gal.....	2¢
gal.....	\$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-b cans.....	15¢
Jet Black.....	5¢ doz \$3.50
Japanese.....	5¢ doz \$3.50
Firestone.....	5¢ doz \$2.50
Diamond O. K. Enamel.....	5¢ doz \$1.00
Bonnell's Liquid Stove Polish.....	5¢ doz \$2.00
Bonnell's Paste Stove Polish.....	5¢ doz \$2.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....	12¢4¢
Nickel Plate Paste.....	5¢ doz \$6.00
<b>Tacks, Brads, &amp;c.-</b>	
List, Jan. 2, 1888. (Note: Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	80¢80¢5¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢5¢75¢10¢
Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners'.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢

<b>Common and Patent Brads, 70¢10¢70¢10¢10¢</b>	
<b>Hungarian Nails.....</b>	<b>70¢10¢70¢10¢10¢</b>
<b>Chair Nails.....</b>	<b>70¢10¢70¢10¢10¢</b>
<b>Zinc Glaziers' Points.....</b>	<b>50¢50¢5¢</b>
<b>Cigar Box Nails.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Picture-Frame Points.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Looking-Glass Tacks.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Leathered Carpet.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Brush Tack.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Shoe Finders', List Jan. 2, 1888.....</b>	<b>10¢10¢5¢</b>
<b>Lining and Saddle Nails, List Jan. 1, 1886.....</b>	<b>30¢10¢10¢</b>
<b>Japanned.....</b>	<b>30¢10¢10¢</b>
<b>Double-Pointed Tacks.....</b>	<b>85¢</b>
<b>Wire Carpet Nails.....</b>	<b>50¢10¢</b>
<b>Wire Brads &amp; Nails, see Nails, Wire.</b>	
<b>Steel-Wire Brads, R. &amp; E. Mfg. Co.'s list.....</b>	<b>50¢10¢</b>
<b>Tap Borers-</b>	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33¢45¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33¢45¢
<b>Tapes, Measuring-</b>	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢50¢
<b>Thermometers-</b>	
Tin Case.....	80¢80¢10¢
<b>Thimble Skeins-See Skeins.</b>	
<b>Ties, Bale-Steel</b>	
Standard Wire, list.....	50¢10¢5¢
<b>Tinners' Shears, &amp;c.-</b>	
Shears and Snips (P. S. & W.).....	30¢25¢
Punches, &c.....	30¢25¢
Snips, J. Mallinson & Co.....	33¢4¢
<b>Tinware-</b>	
Stamped, Japanned and Plated, list Jan. 20 1887.....	75¢75¢5¢
<b>Tire Benders, Upsetters, &amp;c-</b>	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfect Tire Bender.....	15¢
<b>Tobacco Cutters-</b>	
Champion.....	20¢10¢30¢
Wood Bottom.....	5¢ doz \$5.00, 45¢
All Iron.....	5¢ doz \$4.25
Nashua Lock Co.'s.....	5¢ doz \$15.00, 50¢55¢
Wilson's.....	55¢
Sargent's.....	5¢ doz \$24, 55¢10¢
Acme.....	5¢ doz \$20.00, 40¢
<b>Transom Lifters-</b>	
Wollensak's:	
Class 8 and 4, Bronze Iron.....	50¢
Class 8 and 4, Bronze Metal.....	25¢
Class 8 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiter's, list Jan. 1, 1887.....	50¢10¢2¢
Bronzed Iron Rods.....	50¢10¢2¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	50¢10¢2¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
<b>Traps-</b>	
<b>Game-</b>	
Newhouse.....	35¢40¢25¢
Oneida Pattern.....	70¢70¢25¢
Game, Blake's Patent.....	40¢10¢5¢
<b>Mouse and Rat-</b>	
Mouse Wood, Choker, 7 doz holes, 11¢12¢	
Mouse, Round Wire.....	5¢ doz \$1.50, 10¢
Mouse, Catch, Wire.....	5¢ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	5¢ doz \$2.50, 10¢
Mouse, Bonanza.....	5¢ gr \$10.00
Mouse Delusion.....	5¢ gr \$10.00
Rat, "Decoy".....	5¢ gr \$10.00, 10¢
Ideal.....	5¢ gr \$10.00
Cyclone.....	5¢ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	5¢ doz 90¢
In full cases.....	5¢ doz 75¢
<b>Trowels-</b>	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diastion's Br & Plastering, 25¢25¢10¢	
Peace's Plastering.....	25¢
Clement & Maynard's.....	15¢20¢
Rose's Brick.....	15¢20¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
<b>Triers-</b>	
Butter and cheese.....	25¢
<b>Trucks, Warehouse, &amp;c.-</b>	
B. & L. Block Co.'s list, '82.....	40¢
<b>Tubes, Boiler-</b>	
See Pipe.	
<b>Twine-</b>	
<b>Flax Twine-</b>	
No. 9, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 28¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 25¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 25¢
No. 36, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 284, Matras, 1/4 and 1/2 B Balls.....	48¢50¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Mason Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring).....	11¢
3-Ply Hemp, 1 B Balls.....	12¢12¢
3-Ply Hemp, 1 1/2 B Balls.....	11¢11¢
Cotton Wrapping, 6 Balls to lb.....	15¢10¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool.....	6¢40¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
<b>Vises-</b>	
Solid Box.....	60¢60¢5¢
Parallel.....	15¢10¢
Fisher & Norris Double Screw.....	25¢30¢

Parker's.....	20¢25¢
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢5¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢5¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	30¢
<b>Saw Filers—</b>	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	33½¢10¢33½¢10¢10¢
Stearns's Silent Saw Vises.....	33½¢8¢5¢
Sargent's.....	60¢40¢
Hopkins.....	5¢ doz \$17.50, 10¢
Reading.....	40¢10¢
Wentworth.....	20¢10¢
Combination Hand Vises.....	5¢ gr \$42.00
Cowell Hand Vises.....	35¢
Bauer's Pipe Vises.....	10¢
<b>Wagon Boxes—</b>	
Per 2.....	2½¢
<b>Wagon Jacks—</b>	
Daisy.....	25¢
<b>Washer Cutters—</b>	
Smith's Pat.....	5¢ doz \$12.00, 20¢10¢10¢
Johnson's.....	5¢ doz \$11.00, 33½¢
Penny's, 5¢ doz Pol. \$14; Jap'd, \$16.00, 55¢	
Appleton's.....	5¢ doz \$16.00, 60¢10¢
Bonney's.....	30¢10¢
<b>Washers—</b>	
Size.....	5-16 ¾ ½ ¾ 1 1 ½ 1 ¾ 1 ½
Washers.....	5¢ 4¢ 4¢ 3¢ 3¢ 3¢ 3¢ 3¢
In lots less than 200 lb, 5¢ doz, add ¼¢ 5-b boxes 1¢ to list.	
<b>Wedges—</b>	
Iron.....	5¢ doz 8¢4¢
Steel.....	5¢ doz 8¢4¢
<b>Well Buckets, Galvanized—</b>	
Hill's, 5¢ doz, 12 qt. \$4.25; 14 qt. \$5.25; 16 qt. \$6.25; 18 qt. \$7.25	
Whiting's Flat Iron Band.....	\$4.25-\$4.50
Whiting's Wired Top.....	5¢ doz \$4.00¢1.25
<b>Well Wheels—</b>	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
<b>Wire—</b>	
<b>Iron—</b>	
Market,	
Br. & Ann., Nos. 0 to 18.....	70¢10¢70¢
Cop'd, Nos. 0 to 18.....	70¢70¢75¢
Galv., Nos. 0 to 18.....	25¢5¢
Tin'd, Tinned list Nos. 0 to 18.....	67½¢
Stone,	
Br. and Ann'd, Nos. 16 to 18, 72½¢	
Bright and Ann'd, Nos. 19 to 28, 75¢	
Br. and Ann'd, Nos. 27 to 36, 75¢10¢5¢	
Tinned.....	70¢70¢10¢
Tinned Broom Wire.....	70¢5¢70¢10¢
Galvanized Fence.....	65¢
Annealed Fence, Nos. 8 and 9.....	75¢
Annealed Grape, Nos. 10 to 14.....	75¢
Cool's Galvline.....	15¢20¢
Copper, Flat Jan. 18, 1884.....	25¢
Barb Fence.....	See Trade Report
Wire on Spools.....	65¢
Malin's Steel and Tin'd Wire on Spools.....	40¢
Malin's Brass and Cop. Wire on Spools 300'.....	50¢
Cast Steel Wire.....	50¢
Stubs' Steel Wire.....	\$6.00 to 2, 30¢
Steel Music Wire, Nos. 12 to 30, 55¢ gr 1000, list, 50¢	
Picture Wire.....	New list, 50¢
Barb Wire Safety Guards.....	1000, \$9.00, 25¢
Wire Clothes Lines, see Lines.	
<b>Wire Cloth, Netting, &amp;c.—</b>	
Painted Screen Cloth, good quality	
5¢ 100 sq. ft., \$1.80 to \$1.90	
Galvanized Wire Netting.....	75¢76½¢
<b>Wire Goods—</b>	
See Bright Wire Goods.	
<b>Wire Rope—</b>	
List May 1, 1886.	
Iron.....	30¢
Cast Steel.....	40¢
<b>Wrenches—</b>	
American Adjustable.....	70¢10¢
Baxter's Adjustable "S".....	40¢10¢50¢
Baxter's Diagonal.....	40¢10¢50¢
Allen's Pattern.....	55¢35¢
Cox's "Mechanics".....	55¢10¢35¢
Girard Standard.....	70¢10¢
Machinists', Sterling Wrench Co. 70¢10¢	
Lamson & Sessions' Engineers'.....	60¢10¢
Lamson & Sessions' Standard.....	70¢10¢
Goes' Pattern, Wrought.....	New list, 50¢
Girard Agricultural.....	80¢80¢55¢
Lamson & Sessions' Agric'l.....	
Sterling Wrought.....	
Bemis & Call's	
Pat. Combination.....	35¢
Merrick's Pattern.....	35¢
Allen's Pattern.....	25¢
Cylinder or Gas Pipe.....	4½¢5¢
No. 3 Pipe.....	40¢10¢
Aiken's Pocket (Bright).....	\$6.00, 50¢10¢
The Favorite Pocket.....	5¢ doz \$4.00, 40¢
Webster's Pat. Combination.....	20¢
Boardman's.....	20¢10¢
Allen's Ready.....	25¢5¢
Alligator.....	25¢
Donohue's Engineer.....	20¢10¢
Acme, Bright.....	60¢35¢
Acme, Nickled.....	50¢35¢
Walker's.....	55¢25¢
Diamond Steel.....	55¢25¢
<b>Wringers, Clothes—</b>	
List March 11, 1880, 2½ cash.	
<b>Wrought Goods—</b>	
Staples, Hooks, &c., list Jan. 12, 1886	
Always Eastern.....	80¢2½¢ gr 25¢



# THE IRON AGE

THURSDAY, APRIL 18, 1889.

## Submarine Railroad Tunnel.

A grand railroad tunnel beneath the bed of the river St. Clair, at Port Huron, Mich., to cost probably \$5,000,000, is among the most important of modern engineering projects. The engineers Sooy-smith & Co., of New York, contracted with the Grand Trunk Railway Company for the work and preliminary surveys were made some months ago. The company now take charge of the project. The work of excavation on the American side will begin about 2500 feet back from the river, from which point there will be a steady decline to a depth of about 50 feet. The drift from the tunnel proper will be 22 feet in diameter, and the distance from one river bank to the other is 2200 feet.

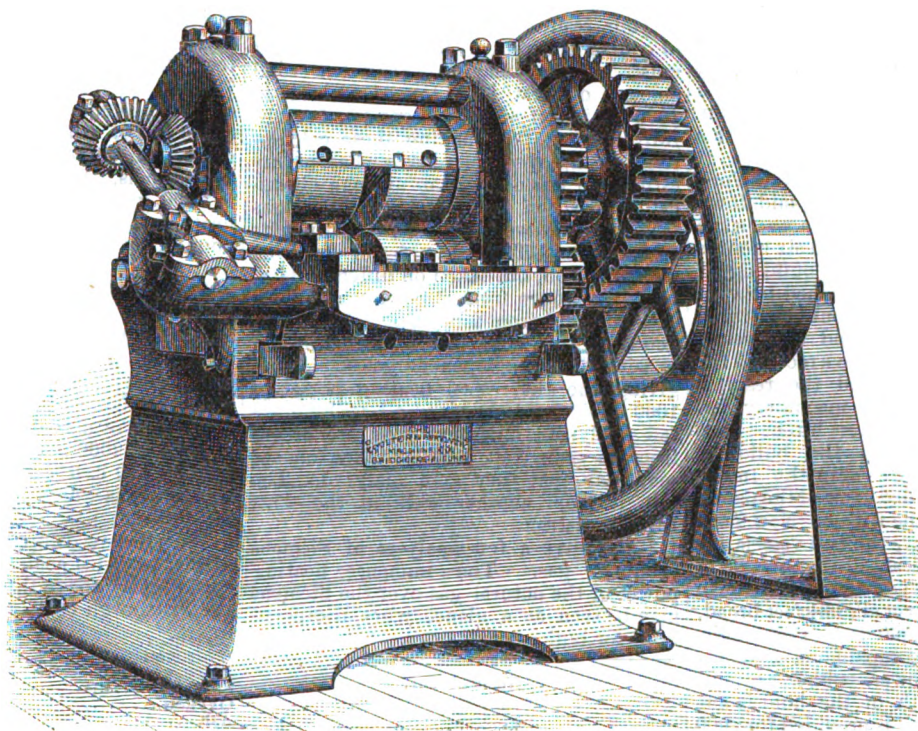
Treasury Department decides that the steel plates for the tunnel must pay the regular duty.

## Rolling Mill.

The accompanying illustration represents a 4-ton rolling mill recently built for the Chicago Tire and Spring Company by the Coulter & M'Kenzie Machine Company, of Bridgeport, Conn. It is designed particularly for tapering the 5 x  $\frac{1}{4}$ -inch steel plates used for locomotive truck springs. All the parts liable to wear or break are made of steel.

On the front of the machine is a sliding table, arranged for squeezing and straightening the blank. The faces of the rolls are so formed and so placed in relation

on three or four cents a day and get decent clothing for \$5 a year. The Admiral says there is no reason except the timidity of American capitalists to prevent our having a large share of the trade of this great and growing country, soon to make itself felt among the family of nations. He cannot see why they should not have American machinery or why there should be a fleet of 50 merchant steamships built by the English instead of by Americans. He can see no reason why our present commerce with Japan should be carried in English bottoms any more than the date crop of Persia should be brought to us by the English. As an illustration of the way the English ships do it, the Admiral says he came home in an English "ocean tramp" steamship, which started at Yokohama



ROLLING MILL, BUILT BY THE COULTER & M'KENZIE MACHINE COMPANY.

The tunnel will have a drop of 90 feet to the mile, the lowest end being on the Canadian side. The work of excavating in the tunnel will be done with large steel "shields," 22 feet in diameter, driven into the earth with 24 powerful hydraulic jacks. A large hydraulic engine will be used to work the jacks, and as fast as the earth is excavated it will be loaded on small trucks for removal. A gang of men will follow with the lining of the tunnel, which is cast iron. The tunnel will thus be completed as the work progresses. A blowing engine will force air into the tunnel through a 24-inch pipe. A force of 125 men will be employed on each side of the river night and day. The Collector at Port Huron reports that it will take about three months to put the plates together in the required form. The finished tunnel will comprise 2500 feet on the American side, 2200 under the river and 3000 on the Canadian side. It is estimated that the work will cost \$2,500,000, although well-informed men predict that it will cost nearer \$5,000,000. President Sir Henry Tyler and Manager Hickson have been heard to remark that it will be completed if it costs \$10,000,000. The United States

to each other as to give to the ends of the blank the taper found in spring plates. This action of the rolls spreads the ends and increases the width of the plate at those points. This excess is reduced by the sliding table, which moves transversely in front of the rolls, and is operated by a pitman connecting one end with a crank or eccentric on a shaft driven by the upper roll-shaft through beveled gearing. This machine may be used for forming file blanks, or similar work now usually done under the hammer. Tapering, squeezing and straightening are performed at one heat, and can be carried on as rapidly as the blanks can be heated and fed to the machine.

**Progress in Japan.**—Admiral Shufeldt, just returned from Japan, gives a glowing description of that country, with its postal service as good as our own, excellent telegraph system, free public schools everywhere, a national mint and banking system similar to the American, &c. The Admiral saw few beggars in Japan or large prisons and almshouses. Neither is there any great accumulations of wealth. The common people can live

and stopped at various ports in China and came through the Suez Canal, picking up cargo for New York all the way, and arriving here with about 5200 tons of freight, realizing \$60,000 for the ship at a cost of only about \$30,000. This ship was managed by a crew of about 43 men all told, with all modern appliances, and needed only four men on deck to keep her running. She came through the Suez Canal with nine other ships, eight of which were English.

An underground railroad project just brought out in Philadelphia causes much excitement. The scheme involves the expenditure of at least \$25,000,000. The corporation has been organized as the Broad and Market Streets Underground Railway Company. P. P. Bowles, manager of the Fairbanks Scale Company, is the president. Ex-Gas Trustee James E. Salter is the secretary and treasurer. The plans are for the construction of a four-track road. Two tracks are to be set aside for fast trains and the other two for trains that will stop at stations to be erected about half a mile apart.



### The New Inman Steamer City of Paris.

According to reports of English newspapers, the new steamer City of Paris, which recently made her first trip across the Atlantic, bids fair to rival in speed the present ocean greyhounds. When steaming toward the Alfred Dock, Birkenhead, she performed the remarkable feat of turning almost around in her own length, thereby greatly increasing the interest of the spectators who were watching her. The new vessel is a *fac-simile* of the City of New York, but is expected, in regard to her steaming qualities, to far distance her prototype. According to the present plans, she will first be submitted to a thorough and practical test of one or more voyages to New York in order to insure easy working of her machinery. The reports state that on the trial trip, when the water was a trifle rough and the wind strong, the ship was driven at 15 knots, then at 18, then at 20, the engines all the time working with complete satisfaction. The final trip was an extended run, during which 21.59 knots an hour were registered. During the run from Greenock to Liverpool, with strong head winds and through a choppy sea, the ship made 20 knots an hour, this rate being continued the greater part of the night. Although the City of New York and City of Paris are sister ships, laid down at the same time and built from the same designs, the latter has occupied six months longer in construction. The building of the City of New York was pushed forward to meet the press of traffic; but the City of Paris has been carefully and elaborately finished, and her engines have received the most minute attention, and the result is that, although new, the machinery has worked without the slightest hitch. Two years were occupied in the building. Except that in the newer ship the Inman Company have discarded some of the patent apparatus which in the City of New York worked unsatisfactory, the two vessels are in every detail identical. Like the City of New York, this latest addition to the Inman line is 565 feet long over all, 63½ feet broad, 42 feet deep, and 10,500 tons gross register. Her engines are capable of developing 20,000 horse-power. She has five decks, and the depth of the hold is 39½ feet. Accommodation is provided for 2000 passengers—700 first-class, 390 second-class, and the remaining 910 steerage. As regards her decorations and appointments, the vessel is literally a floating palace, replete not only with every comfort, but luxury. She has a promenade deck extending from stem to stern. Below, the saloon dining-room is capable of accommodating 300 passengers; it is the width of the ship, and has an arched roof 20 feet high, with alcoves along the sides. At the after end of this spacious saloon there is a large hall, in which is placed a grand staircase leading down to the luxurious drawing-room and library. The smoking-room, another elaborately fitted apartment, is on the upper deck. It is 45 feet long and 27 feet broad, and will hold 130 votaries of the weed. It is a feature of the City of Paris, as of her sister ship, that there are provided for saloon passengers a number of elegantly appointed private sitting-rooms, as well as private bathrooms. Altogether the state-rooms for first-class passengers number about 480. For the second-class passengers there have been provided a tastefully decorated and elegant dining hall, 40 feet wide, 27 feet high, and capable of holding 150 diners. There are also 96 second-class state-rooms. The ship is divided into water-tight compartments, without doors, and would be perfectly seaworthy with three of these divisions flooded. She has a double bottom, capable of holding 1500

tons of water ballast, and to prevent her rolling is fitted with a water chamber, extending the width of the ship and half filled with water, by which any tendency to oscillation is so successfully counteracted that on the passage from Glasgow the motion of the ship was scarcely perceptible. She is lighted by 1000 incandescent electric lamps, fed by a current from five powerful electrical machines stationed in the engine-room.

### Natural Gas vs. Coke and Coal.

Prof. S. A. Ford, chemist of the Edgar Thomson Steel Works, at Braddock, Pa., recently contributed the following interesting article to the Greensburg (Pa.) Press, which we reproduce:

So much has been claimed for natural gas as regards the superiority of its heating properties as compared with coal that some analyses of this gas, together with calculations showing the comparison between its heating power and that of coal, may be of interest to your readers. These calculations are, of course, theoretical in both cases, and it must not be imagined that the total amount of heat in a ton of coal or in 1000 cubic feet of natural gas can ever be fully utilized. In making these calculations I employed as a basis what in my estimation was a gas of an average chemical composition, as I have found that gas from the same well varies continually in its composition. Thus, samples of gas from the same well, but taken on different days, vary in nitrogen from 23 per cent. to *nil*, carbonic acid from 2 per cent. to *nil*, oxygen from 4 per cent. to 0.4 per cent., and so with all the component gases. Before giving the theoretical heating power of 1000 cubic feet of this gas I will note a few analyses. The first four are of gas from the same well, samples taken on the same day that they were analyzed. The last is from another well in the East Liberty district.

I also give a few analyses of Siemens producer gas. The immense heating power of the natural gas over the Siemens may be seen at a glance when compared bulk for bulk:

Natural Gas.					
	1.	2.	3.	4.	5.
When Tested.....	Oct. 23, 1884.	Oct. 29, 1884.	Oct. 24, 1884.	Dec. 4, 1884.	Oct. 18, 1884.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Carbonic acid.....	0.8	0.6	<i>nil</i>	0.4	<i>nil</i>
Carbonic oxide.....	1.0	0.8	0.58	0.4	0.1
Oxygen.....	1.1	0.8	0.78	0.8	2.10
Olefiant gas.....	0.7	0.8	0.98	0.6	0.8
Ethylid hyd'e.....	3.6	5.5	7.92	12.3	5.2
Marsh gas.....	72.18	65.25	60.70	49.58	57.86
Hydrogen.....	20.62	26.16	29.03	35.92	9.64
Nitrogen.....	<i>nil</i>	<i>nil</i>	<i>nil</i>	<i>nil</i>	23.41
Heat units.....	728,746	698,853	627,170	745,813	592,380
Siemens Producer Gas.*					
Carbonic acid.....	3.9	8.7	9.3	1.5	6.1
Carbonic oxide.....	27.3	20.0	16.5	23.6	22.3
Hydrogen.....	.....	8.7	8.8	6.0	23.7
Marsh gas.....	1.4	1.2	2.7	3.0	1.0
Nitrogen.....	67.4	61.4	62.9	66.9	41.9
Heat units.....	93,966	97,184	99,074	114,989	16,416

\* See Vol. XI, p. 800, Transactions of American Institute of Mining Engineers.

We will now see how the natural gas compares with coal, weight for weight, or, in other words, how many cubic feet of gas will contain as many heat units as a given weight of coal—say a ton. In order to accomplish this end we will be obliged, as I have before said, to assume as a basis for our calculations what I consider a gas of an average chemical composition, namely:

	Per cent.
Carbonic acid.....	0.6
Carbonic oxide.....	0.6
Oxygen.....	0.8
Olefiant gas.....	1.00

Ethylid hydride.....	5.00
Marsh gas.....	67.00
Hydrogen.....	22.00
Nitrogen.....	3.00

Now, by the specific gravity of these gases we find that 100 liters of this gas will weigh 64.8585 grams, thus:

Marsh gas.....	67.0 L.	weighs	48.0256 grms.
Olefiant gas.....	1.0	"	1.2534 "
Ethylid hydride.....	5.0	"	6.7200 "
Hydrogen.....	22.0	"	1.972 "
Nitrogen.....	3.0	"	8.7652 "
Carbonic acid.....	0.6	"	1.2257 "
Carbonic oxide.....	0.6	"	0.7526 "
Oxygen.....	0.8	"	1.1468 "

Total..... 64.8585

Then if we take the heat units of these gases we will find that:

	Grams	Heat units.
Marsh gas.....	48.0256	627,358
Olefiant gas.....	1.2534	14,910
Ethylid hydride.....	6.7200	77,679
Hydrogen.....	1.9712	87,930
Nitrogen.....	3.7680	.....
Carbonic oxide.....	0.7526	1,806
Carbonic acid.....	1.2257	.....
Oxygen.....	1.1468	.....
Total.....	64.8585	789,604

64.8585 grams is almost exactly 1000 grains, and 1 cubic foot of this gas will weigh 267.9 grains; then the 1000 liters, or 64.8585 grams, or 1000 grains, is 3.761 cubic feet. 3.761 cubic feet of this gas contains 789,604 heat units and 1000 cubic feet will contain 210,069,604 heat units. Now, 1000 cubic feet of this gas will weigh 265,887 grains, or, in round numbers, 38 pounds avoirdupois. We find that 64.8585 grams, or 1000 grains, of carbon contains 52,404 heat units and 265,887 grains, or 38 pounds, of carbon contains 139,398,896 heat units. Then 57.25 pounds of carbon will contain the same number of heat units as the 1000 cubic feet of the natural gas—viz., 210,069,604. Now, if we say that coke contains in round numbers 90 per cent. carbon, then we will have 62.97 pounds of coke equal in heat units to 1000 cubic feet of natural gas. Then if a ton of coke, or 2000 pounds, costs \$2.50, 62.97 pounds will cost 7½ cents, or 1000 cubic feet of gas is worth 7½ cents for its heating power.

We will now compare the heating power of this gas with coal, taking as a basis a coal slightly above the general average of the Pittsburgh coal—viz.:

Carbon.....	82.75
Hydrogen.....	5.31
Nitrogen.....	1.04
Sulphur.....	0.95
Oxygen.....	4.64
Ash.....	5.31

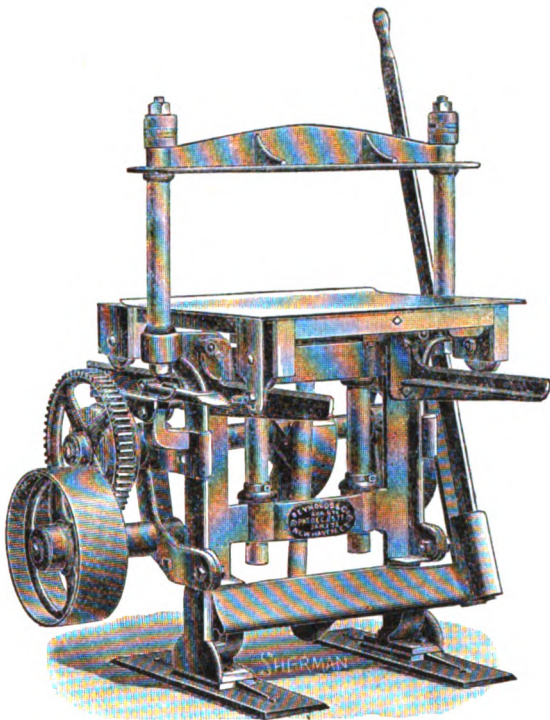
We find that 38 pounds of this coal contains 146,903,820 heat units, then 54.4 pounds of this coal contains 210,069,604 heat units, or 54.4 pounds of this coal is equal in its heating power to 1000 cubic feet of the natural gas. If our coal costs us \$1.20 per ton of 2000 pounds, then 54.4 pounds costs 3½ cents, and 1000 cubic feet of gas is worth for its heat units 3½ cents. As the price of coal increases or decreases the value of the gas will naturally vary in like proportions. Thus, with the price of coal at \$2.50 per ton, this gas will be worth 6½ cents per 1000 cubic feet. If 54.4 pounds of coal is equal to 1000 cubic feet of gas, then 1 ton of coal is equal to 36,764 cubic feet. In these calculations of the heating power of gas and coal no account is, of course, taken of the loss of heat by radiation, &c. My object has been to compare these two fuels merely as regards their actual value in heat units.

In collecting samples of this gas I have noted some very interesting deposits from the wells. Thus, in one well the pipe was nearly filled up with a soft grayish-white material, which proved on testing to be chloride of calcium. In another well, soon after the gas vein had been struck, crystals of carbonate of ammonia were thrown out, and upon testing the gas I found a considerable amount of that alkali, and with this well no chloride of calcium was observed until about two months after the gas had been struck.



**Hand or Power Molding Machine.**

This machine may be operated either by hand or power, so that, if desired, the compression may be produced by power, or, in the absence of power, it may be produced by hand. The two platens are arranged one above the other, the lower moving up and down and the upper swinging backward and forward; when the latter is brought forward over the other the mold on the lower is forced up against the upper platen to compress the sand, and then as the lower platen drops the upper is thrown backward for the removal of the prepared mold and the preparation for another. The lower platen is supported upon two vertical slides working through guides in the bars of the frame. Placed in bearings in the lower part of the frame is a rock shaft having a backwardly projecting arm, upon which rests a strut bearing against the under side of the lower platen, so that when the shaft is turned it



HAND OR POWER MOLDING MACHINE, MADE BY REYNOLDS & CO.

will raise or lower the platen. The shaft is operated to produce the compressing movement by means of an elastic lever. The upper platen is carried by two rods hung on trunnions at their lower ends. In operation the flask and sand with the mold are placed upon the lower platen, when the upper platen is drawn forward and the lever moved to raise the lower platen and compress the sand in the mold.

Power is applied to the machine by a cam working against the back of the spring lever and mounted upon a shaft to which power is transmitted. The construction is such that the rock or cam shaft only rises to produce compression when the upper platen is in its forward position over the lower; a single revolution of the shaft then produces the compression, when power is automatically detached. When it is desirable to operate the machine by hand the power attachment can be easily disengaged.

This machine is made by Reynolds & Co., of New Haven, Conn., who also manufacture other forms of molding machines which have been long and favorably known.

The grand ship canal between Liverpool and Manchester is being made with wonderful rapidity. An English paper says

an army of 15,000 men, supplemented by colossal steam diggers, scoop out day by day the pathway along which steamships will ere long glide to and from Cottonopolis and the sea.

**The Past and Present of Pittsburgh Natural Gas.**

A recent circular, relating to a proposed new mortgage loan of \$2,500,000 of the "Philadelphia Company," Geo. Westinghouse, president, and Chas. Paine, vice-president and general manager, who practically control the natural gas supply in and around Pittsburgh, gives a succinct statement of the past and present of this great product:

*Organization.*—The Philadelphia Company were reorganized May 24, 1884, under the provisions of a special charter, originally granted to the Empire Contract Com-

pany by an act approved March 20, 1871. The rights, powers, privileges and franchises conferred by and in said act of incorporation are exceptional in their nature and value, and are enjoyed by no other natural gas company.

*Business.*—Notwithstanding the liberal scope of its charter, the business of the company is at present confined to the mining, conveyance and sale of natural gas. Although the existence of this wonderful product has been known for centuries, and its utilization attempted in a small way ages ago, the year 1875 marked its first introduction in the manufacture of iron, and not until the product of the famous Murrysville Well was piped to Pittsburgh in 1883 did the people of Western Pennsylvania realize its value and recognize in it the fuel of the future.

*The Past and Present.*—Entering the field in 1884, the Philadelphia Company found it already occupied; but, equipped by the inventive genius of their promoter, Mr. Geo. Westinghouse, Jr., with many appliances for the safe conveyance of gas, and backed by a capital of \$5,000,000, subsequently increased to \$7,500,000, the Philadelphia Company soon distanced their competitors. So great was the advantages gained by an unfailing supply of gas, superior facilities for delivering the same,

and an almost entire immunity from accident, that finally most of the competing companies sought and obtained the privilege of incorporation with the Philadelphia Company, or placed their lines in their hands for operation under lease. Thus the company practically control the gas supply of the cities of Pittsburgh and Allegheny and their suburban villages; also 13 surrounding towns and boroughs. Reference to the accompanying map (not engraved) will show the extent of the company's mains and their favorable location. Originating in the three greatest anticlinal reservoirs yet discovered—Murrysville, Grapeville and Canonsburg—they carry the product of 200 producing wells to Pittsburgh by 19 different routes, supplying on the way the towns and villages mentioned. By a comparatively small expenditure the adjacent fields of Bakertown and Belle Vernon, where the company have large tracts of promising gas territory in reserve, can be made tributary to the company's supply.

*The Low-Pressure System.*—The cities of Pittsburgh and Allegheny are supplied with gas at low pressure through a system of mains and service lines aggregating 258 miles in length, of which 206 miles, owned in fee by the company, cost considerably more than \$2,500,000. This portion of the company's work is practically completed, nearly every street of any consequence having already been piped. The principal mains are of unusual size, being from 20 to 36 inches in diameter. All city lines have been constructed in the most approved and substantial manner, with double joints, escape-pipe, and other patent appliances, which, with automatic regulators and cut-offs, reduce the chances of accident to a minimum.

*The company's plant now is:*

	Miles.	
Pipe lines owned in fee . . . . .	524.18	
Pipe lines operated under leases . . . . .	185.29	709.47
	Acres.	
Gas lands owned in fee . . . . .	881	
Gas and oil rights in fee . . . . .	2,194	
Gas and oil leases . . . . .	14,551	17,126
Gas and oil rights and leases of leased companies . . . . .	16,773	
Total gas territory controlled by Philadelphia Company . . . . .	33,899	
Number of producing wells . . . . .	200	
	Miles.	
Telephone lines owned in fee . . . . .	121.75	
Telephone lines leased . . . . .	65.50	187.25

*Consumers.*—On January 1, 1889, the Philadelphia Company were supplying 750 manufacturing establishments, including 38 iron and steel works, &c., and 23,080 houses. The quantity of gas required for this service approximates 500,000,000 cubic feet per day, which is equal to about 25,000 tons or 2500 carloads of coal displaced.

*Earnings and Expenses from October 1, 1885, to December 31, 1888.*

	Earnings.	Expenses.
1885 . . . . .	\$533,495	\$189,297
1886 . . . . .	1,635,886	579,743
1887 . . . . .	1,756,769	735,055
1888 . . . . .	2,624,159	741,653
Total . . . . .	\$6,450,309	\$2,245,748
All new wells . . . . .		225,657
Field pipe lines, station buildings, right of way and telephone lines . . . . .		207,000
Rents paid leased companies . . . . .		411,572
Total operating expenses, &c. . . . .		\$3,068,977
Net earnings . . . . .		3,380,331
Less dividends paid . . . . .		2,423,230
Surplus invested . . . . .		\$957,051

Since January 1, 1888, gross operating expenses include the total cost of all new wells, field lines, telephone lines and other items that might be charged to capital. Based on existing contracts, the estimated gross annual revenue now exceeds \$3,100,000, an increase of nearly \$600,000 over the gross revenue of 1888. Since November 20, 1885, the company have paid 40 consecutive monthly dividends of 1 per cent. each on the capital stock.

<i>Assets and Liabilities.</i>	
Available assets—Cash, bills receivable, &c.....	\$384,897
Unavailable—Real estate and plant.....	9,635,584
Total .....	\$10,520,481
<i>Liabilities.</i>	
Capital stock paid in.....	\$7,500,000
Accounts payable.....	111,738
Bills payable.....	1,971,833
Undivided profits.....	937,062
Total .....	\$10,520,481

The circular further points out that to duplicate the Philadelphia Company's system of mains and service lines—constructed under the most favorable circumstances and occupying the vantage ground at every point—and, at the same time, to acquire an amount of gas territory equal in value and extent to theirs, if not impossible would at least require double the capital they have invested. And as to the chance for increasing business, the circular states that adjacent to the company's mains in the cities and towns already piped there are more houses to use gas for fuel than the num-

ber of those already supplied. The reconstruction of mill furnaces on the regenerative principle now being made the condition of continued supply, the extensive introduction of gas-saving appliances and the sale of gas for domestic use by meter only is expected to do away with the waste that has heretofore existed, and so reduce the consumption of gas at least one-half. This saving, it is believed, will enable the company to furnish the houses still unsupplied and thereby greatly increase their revenue. By the employment of incandescent and other patent burners, the use of natural gas for illuminating promises a handsome income in the near future.

To take up the floating indebtedness of the company and provide for an extension of the main lines and distributing system as soon as desirable, the stockholders have authorized an issue of mortgage bonds to the amount of \$2,500,000, of which the company propose to place at present \$1,500,000. The mortgage provides for a payment annually of 10 per cent. of the amount of the bonds, less the accumulated interest on the sinking fund in the hands of the trustees, so that the bonds secured by the mortgage will be extinguished on November 30, 1898.

The increasing wealth of the United States is indicated by the importations of diamonds, an examination of the Custom-

### Electrically-Operated Drawbridge.

The usual method of operating a drawbridge is by means of a pinion mounted on a vertical shaft in bearings on the bridge and engaging with a circular rack secured to the top of the pier, power being supplied by two or three men working a long lever fitting on the vertical shaft, or by a steam engine through suitable gearing. The electric motor has now been brought forward to do this work, and during the past few weeks one has been most successfully operating the Bridgeport, Conn., draw. This bridge, which is 180 feet long, 60 feet wide and weighs 320 tons, was formerly turned by three men,

connected in series. The double switch 16, fuses, reversing switch 15 and rheostat 14 are inclosed in a water-tight box, 13, in the frame-work of the bridge, and are easily accessible from the road-bed. The bridge-tender has everything under complete control and can easily regulate the speed and the direction of rotation of the bridge. The motive power is furnished by a  $7\frac{1}{2}$  horse-power Thomson-Houston motor, 1, securely fastened to the draw by iron braces. On the end of the armature shaft, which revolves at the rate of 1500 turns a minute, is a pinion  $4\frac{1}{2}$  inches in diameter engaging with a gear 15 inches in diameter. The shaft of this gear carries a beveled pinion 5 inches in diameter engaging with one 15 inches in diameter mounted on a vertical shaft. Power is then transmitted through a train the five pinions of which are 7 inches in diameter and the five gears 14 inches in diameter, the faces of all being 4 inches. On the bottom of the last or slowest revolving shaft 8 is an 11-inch pinion, 4, which engages with the

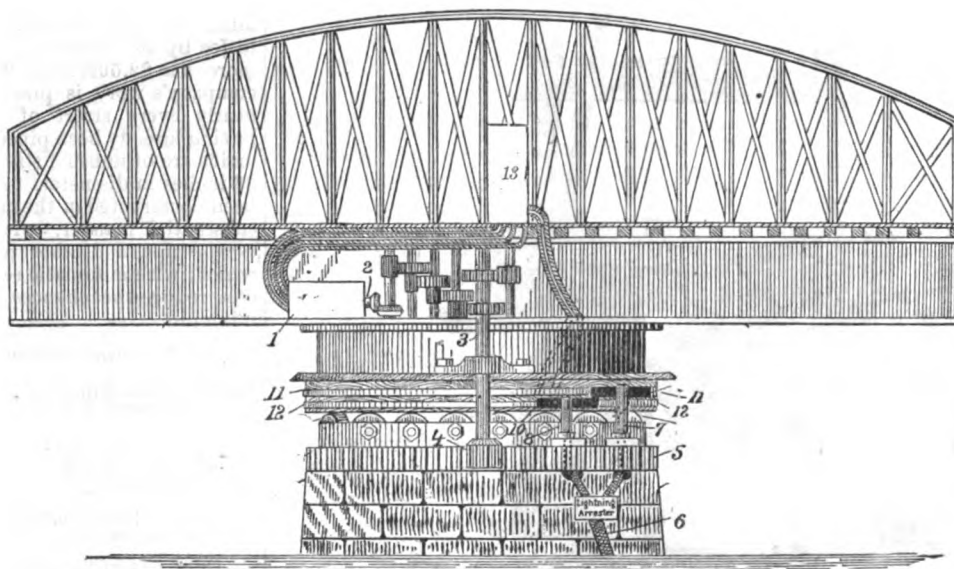


Fig. 1.

### DRAWBRIDGE AT BRIDGEPORT, CONN., OPERATED BY ELECTRIC MOTOR.

but this method was found to be open to serious objection and attended by considerable expense, as it necessitated the constant attendance of the men, and under favorable circumstances the bridge could not be opened in less than six minutes, thus causing a jam on both sides and greatly impeding traffic. By means of the electric motor the draw can now be opened and closed in two minutes, and the expense is limited to the salary of one man and the charge of the electric light company supplying the current.

The current is conducted to the motor through two submarine cables, the core being equal to No. 4 B. & S. copper wire, which are protected from lightning by two Thomson-Houston lightning arresters. The shore ends are connected to the incandescent lighting current of the Bridgeport Electric Light Company by a double-pole switch, so that the current may be shut off at the pleasure of the draw-tender. The other ends are connected to vertical stationary posts 7, 8, which are carefully insulated from the structure, and which carry on their upper ends a pair of brushes, 9, 10, which are in contact with two insulated copper bands, 11, 12, attached to the drum of the bridge. A rheostat, 14, is used to regulate the speed of the motor and a reversing switch, 15, to change the direction of rotation of the armature. The armature, rheostat and fields are con-

ected in series. The double switch 16, fuses, reversing switch 15 and rheostat 14 are inclosed in a water-tight box, 13, in the frame-work of the bridge, and are easily accessible from the road-bed. The bridge-tender has everything under complete control and can easily regulate the speed and the direction of rotation of the bridge. The motive power is furnished by a  $7\frac{1}{2}$  horse-power Thomson-Houston motor, 1, securely fastened to the draw by iron braces. On the end of the armature shaft, which revolves at the rate of 1500 turns a minute, is a pinion  $4\frac{1}{2}$  inches in diameter engaging with a gear 15 inches in diameter. The shaft of this gear carries a beveled pinion 5 inches in diameter engaging with one 15 inches in diameter mounted on a vertical shaft. Power is then transmitted through a train the five pinions of which are 7 inches in diameter and the five gears 14 inches in diameter, the faces of all being 4 inches. On the bottom of the last or slowest revolving shaft 8 is an 11-inch pinion, 4, which engages with the

This installation was built by the New England Electric Supply Company, after designs by J. M. Orford, who has applied for patents upon the apparatus. The shafting and gearing were made at the Follansbee Machine Works, Bridgeport.

**The Strong Locomotive's Time.**—The official report of the recent trial of the Strong locomotive on the Erie Railway gives the following report of time made: "On the eastward trip, the Buffalo Division was covered in 155 minutes, the Susquehanna in 208 minutes, the Delaware in 159 minutes and the Eastern in 141 minutes. The times made up were respectively 8, 18, 21 and 13 minutes, or 60 minutes in all. The fastest mile noted was made in 55 seconds, and many were made in 60 seconds each. On the Delaware Division the distance from Callicoon to Hancock, 28 miles, was covered in 34 minutes, and from Hancock to Deposit, 13 miles, in 20 minutes, the grade being up. On

the Susquehanna Division the distance from Binghamton to Union,  $8\frac{1}{2}$  miles, was covered in 12 minutes; from Union to Owego,  $13\frac{1}{2}$  miles, in 17 minutes; from Owego to Waverly,  $19\frac{1}{2}$  miles, in 23 minutes; Waverly to Elmira,  $17\frac{1}{2}$  miles, in 22 minutes, and from Elmira to Corning,  $17\frac{1}{2}$  miles, in 25 minutes. On the Buffalo Division the distance from Hornellsville to Canaseraga,  $12\frac{1}{2}$  miles, was made in  $18\frac{1}{2}$  minutes; from Castile to Warsaw, 10 miles, in 15 minutes; Warsaw to Attica,  $17\frac{1}{2}$  miles, in 22 minutes."

The Dominion Government is being urged to build a railway bridge across the St. Lawrence at Quebec, to cost \$6,000,-

barges of 1000 tons each, to be built in New Haven, and go on the line between the New Jersey coal docks and Providence, R. I.

#### Norton Brothers' Can Factory.

One of the most remarkable aggregations of automatic machinery is assembled under the roof of Norton Brothers' can factory at Maywood, near Chicago. In the character of the work performed and the results accomplished it is claimed to be superior to anything else in the line of automatic machinery. Norton Brothers are manufacturers of tin cans of every description. They have manufactories at

is the machine-shop, in which all the machines and tools used by the firm are built. It contains an excellent equipment of planers, lathes, drills, &c. A novel feature about it is the tool-room, which is kept on an original plan which is worthy of general adoption. This room is connected by an electric system, similar to that used in hotels, with every part of the machine-shop and other portions of the factory in which tools are likely to be called for by the workmen. A hotel annunciator hangs in a conspicuous part of the tool-room. When a workman wants a tool he pushes a button near him and immediately a "bell-boy" runs to him from the tool-room with a slate and pencil, on which he writes his name and the tool desired. The numbers on the annunciator correspond with the numbers of the buttons, to fix the location of the summons. The boy hands the slate to the tool-room keeper, who has a list of the workmen's names, numbered according to the order in which they are placed on the list, but without reference to the number on the annunciator, which is an independent matter. A rack hangs conveniently near with a sufficient number of pins on it to hold small brass checks numbered to correspond with the workmen's numbers. Each pin holds a stock of several checks of the same number. The toolroom-keeper takes one of the checks of the man who sent for a tool, puts it in the tool-rack from which he takes the article wanted, charges the workman with it in a book kept for the purpose, and sends the boy back with the tool. The time of the workmen is thus saved, there is no confusion in the shop from men loitering to talk with others on their way to and from the tool-room, and a perfect record of the tools is always kept. When the tool is to be returned the boy is again called, the workman is credited with it on the books, and the check is restored to its place on the rack. This is an instance of the methods employed throughout the whole factory, care being taken in every respect to have operations conducted systematically, economically and with the least friction.

Entering the can-making department, a long row of machines is seen, which stretch with their connections from one side of the large building almost to the other. In these machines the tin plate is fed, cut into pieces of the proper size for can-bodies. It is drawn into tubular form over a mandrel, double seamed, and passed on into a carrier. The subsequent operations of heading, soldering, testing for leaks, drying, counting, and delivering either into the warehouse or the car for shipment proceed steadily onward without the intervention of a hand to direct any of the movements of the machinery or to perform any part of the manufacture. The disks for the heads are cut on a number of presses, with the dies so arranged as to cut out the greatest possible number from a sheet of tin plate. The dies are arranged in gangs, and cut out alternate disks at one operation and the intermediate disks at another, as their frame-work would not permit them to be set close enough to cut all out at once. From the largest spaces of tin plate left between the holes thus made a set of gang-dies cuts out can tops, and from the remnant still existing another set of gang-dies cuts out small disks for button covers to be sold to button manufacturers. Use has thus been made of the tin plate as far as possible in these works and the residue is sold for scrap to sash-weight manufacturers.

The caps for cans are already prepared with solder for the soldering iron when they are shipped to the canning factories. This solder is cut out of sheet solder in the form of a ring of the proper size and it is forced on the rim of the cap. It was found necessary to devise a special machine to do this in order to use the solder-

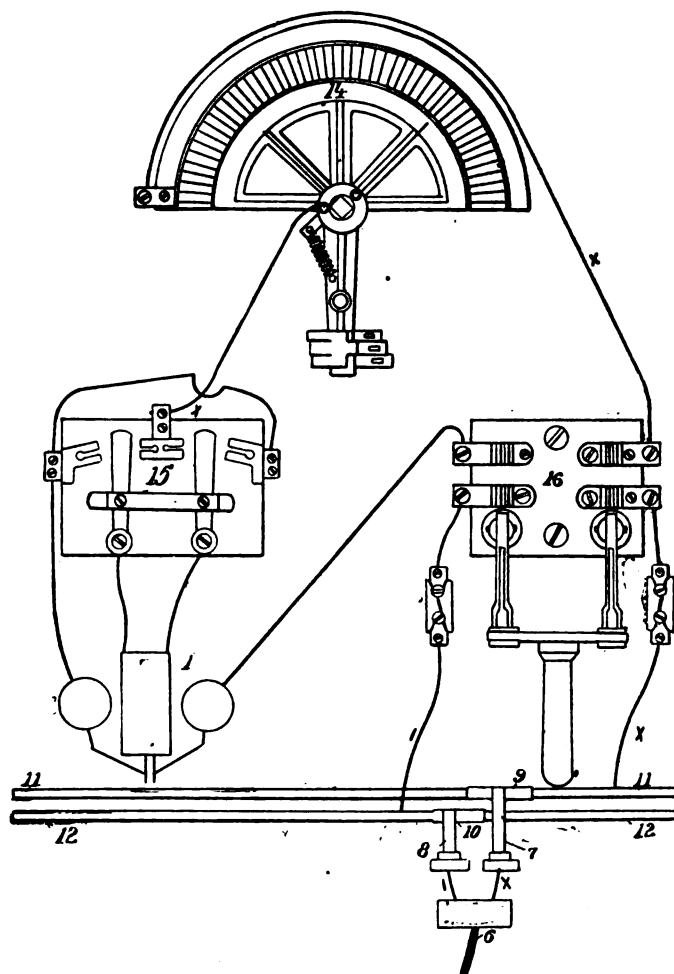


Fig. 2.

DIAGRAM SHOWING ELECTRICAL CONNECTIONS OF BRIDGEPORT DRAWBRIDGE.

000. Already there are two bridges, at Montreal and Lachine, which unite the Colonial system with the Western lines, and a bridge in progress at Coteau will give a third connection for an all-Canadian route between the Atlantic and Pacific.

The coal barge lines in the New York and Eastern trade are increasing their fleets by adding several vessels of the largest capacity adapted to the outside route. At Norwalk, Conn., six barges of about 1300 tons each are building for the New London Outside Towing Line, which is engaged principally in the bituminous trade with Virginia. The Boston Towboat Company is enlarging its scale of operations by building a large number of 2000-ton barges, regular sea-going vessels, provided with sufficient sails to be navigable even though the steam escort should be compelled to cut loose. The New England Transportation Company in like manner will during the season add four ocean

Chicago and at Maywood and are interested in similar establishments at San Francisco, New York and Hamilton, in Canada. Recently they purchased the property of the Abbott Iron Company at Baltimore, and propose to convert the buildings formerly used for rolling mills into a can factory to supply tin cans to the oyster and fruit canners of that part of the country. They own the special machines used in all these factories, which are the invention of Edwin Norton, whose genius in devising and perfecting automatic machinery places him in the foremost rank of those American inventors who have astonished the world with their achievements. The consumption of tin plate in these works is enormous, far exceeding that of any other works in any branch of manufacture in the world. A recent visit to their works at Maywood was full of interest.

Upon entering the factory, the first department into which the visitor is ushered



ing machine which Norton Bros. manufacture for canning factories. The solder being in place, it is easily fused and is in just the proper quantity. The edge of solder on the cap also preserves it from rusting if the caps and cans are carried over from one season to another, and thus avoids what might be, and often has been, a serious loss. The manufacture of sheet solder is carried on in this factory by an original method, which is in itself a revolution in metallurgical methods, and will be more fully described in an additional article. It is sufficient to say here that Edwin Norton has solved the problem of rolling molten metal directly into sheets, which has so long baffled the leading metallurgists of the world, from Sir Henry Bessemer down. For months in one corner of this factory a machine has been in successful operation, producing from molten solder beautifully rolled sheets from 6 to 8 inches wide,  $\frac{1}{16}$  inch thick, at the rate of 400 feet per minute.

A very large stock of tin plate is carried, and a special storehouse has been constructed for it, with every facility for making it a bonded warehouse in case the duty should be advanced as contemplated, when a much heavier quantity would at once be laid in, to be drawn upon as needed afterward.

An addition is just being built to this factory, which is 208 feet long by 137 feet wide, to be used for storage. This building is constructed of wood, with sheet-steel roofing and siding, to make it fire-proof externally. It is intended to hold 25,000,000 cans. It extends for its full length along the Chicago and Northwestern Railroad tracks, with doors placed at regular intervals of a car length apart, so that a number of cars can be loaded at the same time. In connection with the other buildings of the factory there is a frontage of 600 feet on the railroad, with doors arranged in this way for the whole distance. An elevated railroad runs from the car department through a covered passage to the new warehouse, and the cans roll along it by gravity to their destination, which is controlled by suitable switches, traveling over 1000 feet from their starting point. With such facilities it is not strange that a car can be loaded in an hour and a half and that over 100,000,000 cans can be shipped in a season from these works.

### Railroads in Europe.

The French Government has recently published the following statistics showing the length in kilometers of the railroads in Europe at the close of the year 1887 and the new construction during that year:

Country.	Length of the Railroads in Europe.		Per cent.
	Railroads end of 1887.	Additions to roads in 1887.	
	Kilo-meters.	Kilo-meters.	
Germany.....	39,570	1,221	3.18
Austria-Hungary.....	24,708	1,308	5.59
Belgium.....	4,702	168	3.71
Denmark.....	1,969	4	0.20
Spain.....	9,492	183	1.97
France.....	34,234	891	2.67
Great Britain.....	31,698	323	1.03
Greece.....	605	90	17.48
Italy.....	11,616	438	3.92
Netherlands and Luxembourg.....	2,952	94	3.29
Portugal.....	1,829	300	19.62
Roumania.....	2,351	412	21.25
Russia.....	28,518	820	2.96
Servia.....	517	73	16.44
Sweden and Norway.....	8,950	111	1.26
Turkey, Bulgaria and Roumania.....	1,394	.....	.....
Malta.....	11	.....	.....
Totals.....	207,939	6,471	3.21

This is equal to 129,210 miles, or far less than the railroad mileage of the United States.

A Cleveland, Ohio, paper says it looks very much as if \$4,000,000 or \$5,900,000 would be invested in new buildings in

that city this season. If the record for March could be taken for an average, the total for the year would be \$6,000,000 or \$7,000,000.

### Milling Tool Lathe Attachment.

The piston of the Crown water meter is made of vulcanized rubber, and in shape somewhat resembles a widely-spaced gear, as shown by the outlined white part of the

rubber is pressed into shape. Bolted to the shears of the lathe are the two blocks A, Fig. 6, each of which is formed with two bearings. This construction was adopted in order to increase the rigidity of the bar B, which, fitting in the bearings, is supported at four points. This is an essential feature, since, as the size of this bar is controlled by the opening in the mold through which it passes, it is necessarily limited thereby, and all spring-

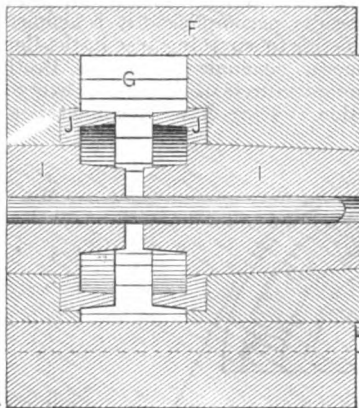


Fig. 1.—Section of Mold and Piston.

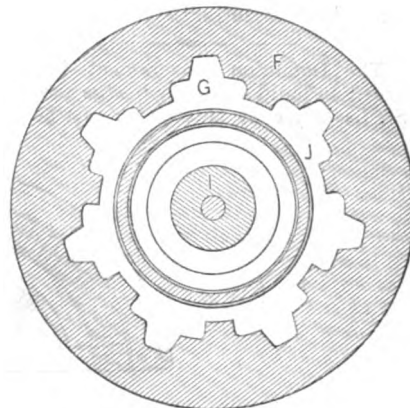
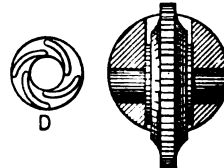
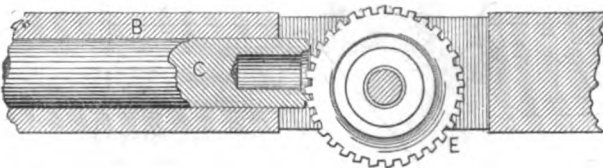


Fig. 2.—Section at Right Angles to Fig. 1.



Figs. 3, 4 and 5.—Longitudinal and Cross Section of Cutter and its Driving Shaft.

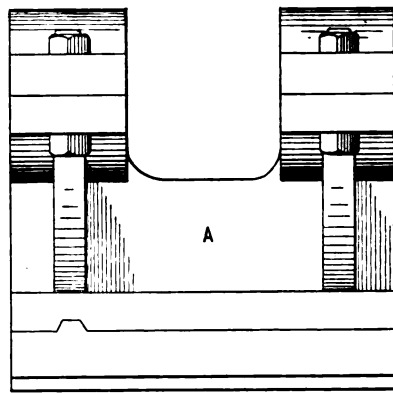
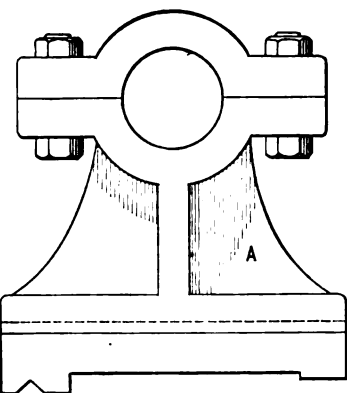


Fig. 6.—Sectional Elevation of Bar Bearings.

### MILLING TOOL LATHE ATTACHMENT.

drawing, Fig. 2. This piston is made by pressure in a steel mold, which, in order to insure the perfect and easy working of the piston, which governs largely the accuracy of the meter, should be formed as nearly true as it is possible to make it. The tool herewith illustrated was designed by the inventor of the meter, L. H. Nash, solely for the purpose of attaining this object. It consists of few and easily-made parts—really only three—is easily adjusted on the lathe, and has been found to be most admirably adapted to milling the interior of pieces of such small size as to cramp the tool. The form of the mold and of the piston is given in Figs. 1 and 2, G representing the piston, F the mold and I J the dies between which the hard

ing of the tool must be prevented in order to insure accurate cutting. One end of this bar is bored to form a bearing for the driving shaft C, which is driven from the headstock. The milling cutter E is mounted on a transverse shaft located a little below the axis of the bar B, and is placed within an opening cut through the bar, as shown in Figs. 3 and 5. The end D of the driving shaft C is formed with four segments of what we may term volute curves, with which the teeth of the cutter E engage. It is now evident that as the shaft C is revolved it will turn the cutter E, the cutting edges of whose teeth are not subjected to wear, as only their rear edges come in contact with the edges of the driving curves. This forms a rigidly-

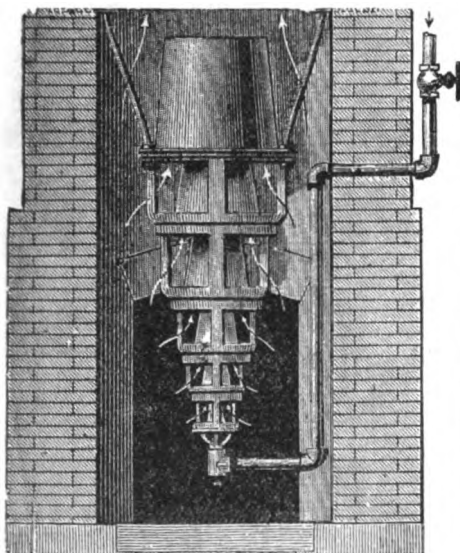


held and simply-driven cutter. The mold blank is passed over the bar and the feed parallel with the bar, to bring the lower or projecting edge of the cutter into action. The cutter shown in Fig. 5 is for cutting the deepest parts of the mold, two others, one for each angle, being needed to complete the work.

We are indebted to Mr. Nash and to the National Meter Company for the loan of drawings from which our cuts were prepared.

### Steam-Jet Chimney Draft Improver.

This machine is applicable whenever insufficient draft exists in chimneys which are too small for the purpose, or when the adjacent buildings are so high as to destroy the natural draft. It is constructed in accordance with the principle of the induced current, and while not decreasing the area, will create sufficient draft under all circumstances. The machine is composed of nozzles of gradually increasing area placed concentrically one above another. Entering the lowest and smallest nozzle is a steam-pipe leading from the boiler. The supply of steam is controlled by a valve



Steam Jet Chimney Draft-Improver.

located near the outside of the chimney. A slight opening of this valve is sufficient to induce a current of air through the side openings of the nozzles, which, multiplying as it ascends, produces a powerful suction at the base of the chimney, with very small consumption of steam. It is stated that these machines, which are being introduced by Amos Aller, 109 Liberty street, New York, have proved very successful wherever used.

Now that the Sandwich Islands have passed from the control of a puppet king into the hands of foreigners—mostly Americans and English—San Francisco papers suggest a movement on the part of the United States directed to the occupation of the strategic points, rather than await a threatened invasion by some other power. The Hawaiian group is becoming an important center of production and commerce. The sugar crop this year is reckoned at 130,000 tons—nearly twice as much as the Louisiana crop. Of rice the islands yield some 10,000,000 pounds annually, and the product of fruit and hides is large. Coffee has not yet been a success on the islands, but that will come. This fine territory, we are reminded, is "absolutely in search of an owner."

Japan has 2000 miles of railroads, 10,000 miles of telegraph wires and 30,000 schools, besides the Imperial University at Tokio.

## Legal Decisions.

### PROMISSORY NOTE—COMPOSITION WITH CREDITORS—NOTE FOR BALANCE OF DEBT.

A. made a composition agreement with his creditors, but he was induced by T., one of them, to give him a note for the balance of his debt. This note was not paid, and an action was brought upon it, to which H. set up the defense that it had been given without consideration, and he defeated T., who carried the case—*Tinker vs. Hurst*—to the Supreme Court of Michigan, where the judgment was affirmed. The Chief Justice, Sherwood, in the opinion, said: "It is very clear that the plaintiff should not recover in this case. All of the creditors by the composition agreement materially contracted with each other that the defendant should be discharged from their debts after the execution of the deed, and therefore any agreement between the debtor and any one of the creditors which gave the latter any special advantage is in fraud of the other creditors, and it cannot be enforced."

### MARINE INSURANCE—PERILS OF THE SEA—EXPLOSION OF BOILER.

M. insured his steamboat Pilot against marine risks, and after its loss by reason of an explosion of its boiler he sued upon the policy. In the complaint the loss was alleged to have resulted from the explosion of the boiler, as the vessel sunk by reason of its having become unmanageable therefrom, and the company in reply alleged that it was not liable for an injury happening from an explosion. The contention of the company was sustained by the court below, and the case—*Miller vs. California Insurance Company*—was carried to the Supreme Court of California, where the judgment was affirmed. Judge Patterson, in the opinion, said: "Perils of the sea are defined by our code to be 'storms and waves; rocks, shoals and rapids; other obstacles, though of human origin; changes of climate; the confinement necessary at sea; animals peculiar to the sea, and all other damages peculiar to the sea.' The bursting of a boiler is not within any of the six causes named. Is it a danger peculiar to the sea? The same thing would have happened had the boiler and engines been on land had the same mismanagement taken place. The sea, waves and wind had nothing to do with it. It is impossible to say that this is a damage occasioned by a cause similar to perils of the sea on any interpretation which has ever been applied to that term."

### PLEDGE—ACCOMMODATION NOTE—SALE OF PLEDGE.

A., B. and C. executed a note to H. for \$25,000 for his accommodation, and secured it by a pledge of their property. H. borrowed of S. \$15,000 on the note and security, and on default S. sold the pledge and bought it for \$15,000, and he then brought suit to foreclose the equity of redemption, claiming as the debt due him the face of the note, \$25,000, and he had judgment. The case—*Handy vs. Sibley*—was taken to the Supreme Court of Ohio, where the judgment was reversed. Judge Dickman in his opinion said: "A pledgee cannot, by a sale and purchase by himself of an accommodation note and mortgage under a special power of sale and purchase from the pledgor, recover upon foreclosure of the equity of redemption more than the sum advanced by him."

### FRAUDULENT SALES—DECLARATIONS OF VENDOR MADE BEFORE AND AFTER THE SALE.

E. was a merchant in the hardware business and he became embarrassed, and two of his creditors—R., to whom he owed \$960, and L., to whom he owed \$1300—insisted upon payment, and as he could

not pay he sold his stock of goods to their attorney-at-law in payment of their demands, who took possession of the stock and store, excluding E. therefrom. The signs of E. were taken down. A few days later H., a judgment creditor of E., seized the goods in the store in execution, and R. and L. sued in replevin to recover the property as belonging to them. On the trial of the case—*Rogers vs. Thurston, sheriff*—E. was a witness for the defendant, and he was permitted, against objection, to testify to the facts: 1. That he had delivered the property to R. and L.'s attorney on the express understanding that he was to still have them to sell until H.'s judgment was paid. 2. That he had informed H. about two weeks before the sale that the goods were worth about \$3000. On this testimony the defendant had judgment, on the ground that the sale was fraudulent as to him, and an appeal was taken to the Supreme Court of Nebraska, where a reversal was had. Judge Maxwell in the opinion said: "The testimony of E. was not admissible; his declarations could not bind the plaintiffs unless there was a conspiracy between them and E. to defraud his creditors by the sale. If there was such a combination, there should have been distinct proof of that fact made before the declarations were admitted. Here there was no attempt even to prove any conspiracy. As to the value of admissions arising out of a conspirator, a leading jurist says: 'Such evidence courts have found to be quite unreliable. It is not uncommon for different witnesses as to the same conversation to give precisely opposite accounts of it, and in instances it will appear that the witness deposes as to the statements of one party as coming from the other.' A substantial rule of evidence compels the reversal of this case. No admissions by a vendor made after he has parted with his title and not connected with the transaction are admissible against his vendee. As to the valuation made by E. before the sale, that simply tended to show that the sale was fraudulent, and such a fact could not be established in that way; some conspiracy, as we have said, must first be made out."

Western millers have been so long shut out from the British market by high prices in the United States that they are fearful of losing the export trade altogether. To learn the prospects numerous inquiries were addressed to correspondents in England, from whom replies have been received agreeing in all the main particulars. The general conclusion reached is that at the present time Great Britain is almost wholly independent of American supplies. Not only has the British product improved in quality, but Hungarian brands so closely resemble the best Minnesota products that the two qualities are scarcely distinguishable. Hungarian flour, therefore, is a formidable rival. Prices have undergone no material change. With reference to trade prospects the present condition is regarded as temporary, correspondents abroad being of the opinion that with a return of abundant crops and prices on an export level the American trade would speedily revive. Even at the present time if prices were satisfactory there would probably be quite a demand for American flour.

Compressible canvas boats, occupying only about 2 feet of space when folded, although capable of carrying 100 men, are being introduced on some of the Cunard steamships. In a trial at Boston 91 men were hurried into one of these boats with safety and rowed about the ship, giving the impression that they will be a valuable part of the ship's equipment.

### The Protection of Blast Furnace Shells.

Samuel McClure and C. F. Phillips, of Sharon, Pa., have devised a method for protecting furnaces and like structures. The invention consists, first, in providing a brick structure—such as a furnace or stack—with a non-conducting water space filled with gravel or other coarse substance; further, in the peculiar arrangement of devices for supplying water to the whole or to any part of the water space; further, to a system of "observation boxes" located in the wall of the structure, by means of which the condition of the water space and furnace lining may be observed.

Fig. 1 represents a vertical section through the wall or lining of a blast furnace. Fig. 2 is a similar section, illustrating a modification. Fig. 3 is a horizontal section on the line *xx* of Fig. 1. A is the lining of the furnace, and B the external iron jacket surrounding it. C represents a space in the lining, which extends from the mantle D to the top of the furnace. This space may be formed as in Fig. 1, where an external course of brick is interposed between it and the jacket B, or as in Fig. 2, where the space is formed between the jacket and the brick-work directly. The entire space is filled with coarse gravel or some similar material, which of itself forms a non-conducting agent. This non-conducting space is supplied with water in whole or in any portion by the following system of water distribution:

E represents a water-pipe constructed in sections *b*, Fig. 3. This pipe is imbedded in the gravel filling the water space at a suitable height and extends horizontally throughout its entire circumference. The ends of the sections are closed and each one is provided with a number of perforations through which the water is admitted to the gravel filling, down which it percolates, thoroughly moistening it below each section of pipe. The sections *b* may be supplied with water from a circular pipe, F, surrounding the furnace and having a branch pipe, *f*, with a suitable valve, *f'*, communicating with each of said sections. A vertical pipe, G, communicates with the pipe F and with a tube, H, connected to any supply of water under pressure. Preferably, however, the pipe F is dispensed with, and each section *b* is supplied by means of a separate vertical pipe, like the pipe G, connected directly to the section and to the tube H and having a suitable cut-off valve. The tube H also surrounds the furnace and is supported by the bracket I. The tube is preferably made as shown in Figs. 1 and 2, with an open trough, J, into which the discharge-pipe K carries any excess of water from the space C, and which should communicate with a suitable drain. The tube and trough are built of iron sections bolted together as shown at *i*, Fig. 1, but may be formed in any other way that may be found desirable.

It will be evident from the description that water can be supplied to any or all of the sections *b* of the inner water-pipe, and thus that any portion of the entire circumference of the graveled space may be thoroughly moistened at will; also that the water may be shut off entirely and such space used as a dry non-conductor.

In order that the condition of the furnace lining and water space may be accurately observed, a series of observation boxes, L, are provided. These boxes are cast of any desired size—say from 4 to 6 inches in diameter—and are preferably square in cross-section. They are cast with a flange at their outer end, by means of which they are bolted to and within the iron furnace jacket, as shown at *l'*, Fig. 1. Their inner end extends a sufficient distance into the brick lining, and,

like the outer end, is open, so that the condition of the lining can be seen. Each box is provided with a slot which registers with the water space, and which while allowing the amount of moisture in the gravel to be ascertained, also permits of evaporation when from any cause it occurs.

tion with the two adjacent boxes in the next tiers above and below. These boxes may be made accessible by platforms at the different tiers or in various other ways.

The device has been applied to the two furnaces of the Stewart Iron Company, at

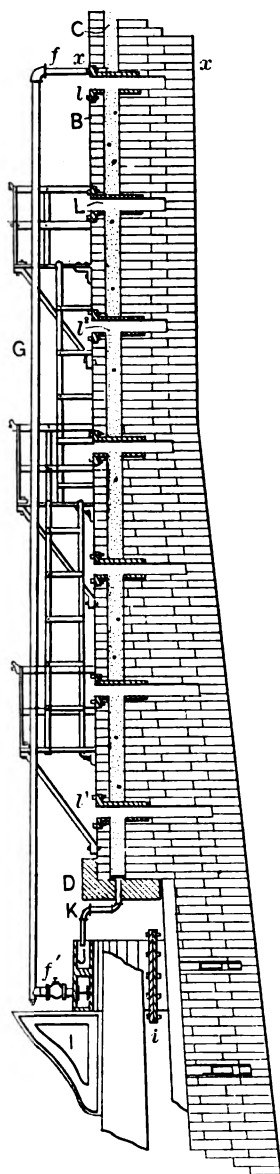


Fig. 1.

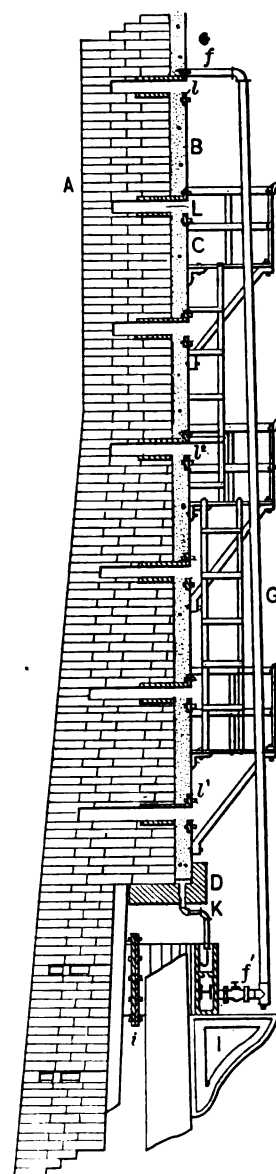


Fig. 2.

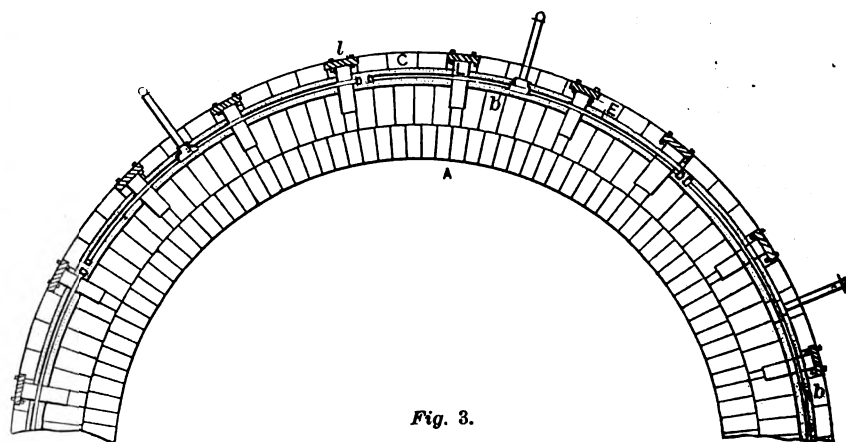


Fig. 3.

#### PROTECTION OF BLAST FURNACE SHELLS.

These boxes are placed around the entire furnace in tiers, the tiers being, say, 3 feet apart, and the boxes in each tier about a similar distance from one another. The tiers may be carried up to the top of the furnace, if thought desirable, or to any height below that, and the boxes in each tier are arranged so as to alternate in posi-

Sharon, Pa.; No. 1, which is 66 feet by 12 feet 8 inches, having been in blast 20 weeks, and No. 2, 70 feet by 13 feet 8 inches, 50 weeks. In both furnaces the space for the gravel is between the 4½-inch casing and the regular lining brick. In No. 2 furnace, the one longest in blast, the observation holes extended to within

13½ inches of the inside face of the well, and to date no appearance of wear is indicated in them. In No. 1 furnace they extended through the lining to within 9 inches of the inside of the face, as shown in our drawings. This 9 inches has not yet been worn away. The device has worked to the entire satisfaction of the Stewart Iron Company, and seems destined to be widely accepted by blast furnace managers.

## THE WEEK.

It is remarked that while New York City is able to dispose readily of \$7,500,000 of bonds at rates paying the investors only 2½ per cent. per annum, the Canadian Government congratulates itself on borrowing \$20,000,000 on terms equivalent to 4½ per cent. There is a difference either in credit or skill in financiering.

The late Isaiah V. Williamson, of Philadelphia, whose munificent endowment of a technical and trade school to be founded in that city will be a permanent memorial, gave during his lifetime \$4,000,000 to philanthropic objects. Outside and beyond the \$2,000,000 given for the building and support of the mechanical school just referred to, the appraisal of personal estate shows an aggregate of nearly \$10,000,000 in stocks, bonds and other securities. The largest single item in the list is the holding of Cambria Iron Company stock amounting to \$606,528. With a cash balance of \$23,488.45 in bank, Mr. Williamson's wearing apparel and strictly personal effects were too insignificant to be given a value.

A discovery of much archæological interest has recently been made near the small town of Painted Cave, Tex. Laborers came upon a graveyard containing Indian and Aztec remains, arrows, battle axes, &c., and a score or two of the peculiar weapon of the Azatlan race were found. This weapon is a short metal axe, with blades of glass. The metal is supposed to be copper, but the specimens just found are so tarnished and incrustured by age and burial that this point has not yet been fully determined. A quantity of Aztec currency, consisting of bits of tin in shape like the letter T, was gathered from among the skeletons.

A Russian firm has obtained from the Italian Government the privilege of erecting petroleum tanks at Leghorn and other Italian ports, and has obtained from the United States machinery for the manufacture of tin cans and cases on the spot. The United States Consul advises that American manufacturers should adopt the same course.

The new Supervising Architect of the Treasury Department is J. H. Windrim, whose duties include the disbursement of large sums of money and the direction of numerous subordinates. He must possess exceptional abilities in the treatment and choice of architectural designs.

An automatic fire sprinkler in the establishment of Koch & Sons, manufacturing stationers, in this city, which was designed to operate only in case the soldering was melted, "went off" without provocation and did \$35,000 damage.

The bankers in New York who were receiving subscriptions to the stock of the American Meat Company (the dressed-beef trust) have withdrawn from the scheme and the subscriptions will be returned. It is understood that the Armour syndicate, which is a large customer of the Cotton-Oil Trust, brought pressure to prevent the threatened conflict of interests. J. H. Flagler, president of the Cotton-Oil Trust, and J. O. Moss, its treasurer, were

president and vice-president of the new meat company, but resigned. The new concern was to control 20,000,000 acres of ranch land, and was backed by important interests.

The completion of the new railroad bridge over the Ohio River at Cincinnati signals the commencement of a new system of traffic by the Baltimore and Ohio Railroad through their Western connections which is expected to build up a large business between the seaboard and the interior.

It is said that the Pennsylvania Railroad now has a controlling interest in three transatlantic lines of steamers, and as they have to make their regular trips the Pennsylvania can charge the regular export rates and then make the steamship companies carry the freight at a loss if necessary. Besides the Pennsylvania, the Grand Trunk has a contract to furnish a certain amount of freight to the Allan Line. It is problematic how the interstate law can reach these particular cases.

Judge Thayer, of the United States District Court at St. Louis, decides that a package of newspapers put on the top of a letter-box is no more in the custody of the Post-office Department than if put on the post-office steps, and that taking the package away is no offense against the law.

Robert Garrett and others, of Baltimore, propose to establish a sugar refinery in that city, and one-half of the \$1,000,000 capital required has already been found.

The New York Subway Commissioners ask the Legislature for an enlargement of their power, or rather the appointment of a new commission, to include the Mayor and other members of the municipal Government. They want to devise some plan which will prevent explosions, the improper tearing up of the streets by the gas and steam-pipe companies, and the leakage from the gas and steam-pipes so far as is possible.

Henry C. Squire's sporting establishment on Broadway was damaged nearly \$50,000 by flames that broke out in the engine-room. The explosion of gas from a broken fixture was among the destructive agencies.

It is reported that the Philadelphia Company has struck near Belle Vernon, 26 miles from Pittsburgh, one of the largest natural gas wells ever opened by a drill.

The annual meeting of the National Academy of Sciences was opened on the 16th inst. at Washington. It is probable that during its session a national society of geologists will be organized.

The British budget shows a diversity of nearly £2,000,000, the estimated values for the current year being placed at £85,000,000, while the expenditures will foot up to nearly £87,000,000, caused by increased army and navy expenses.

It is charged that the threatened strike against the insurance system of the Baltimore and Ohio by its employees is being fomented by agents of life insurance companies.

The condition of affairs along the Panama Canal is described as pitiful. A large number of men are out of work and are approaching starvation. Expensive machinery, being exposed to the weather, is deteriorating considerably.

The reports of the earnings of the railroads upon close study are not shown to be satisfactory. The *Financial Chronicle* reports that for the first three months of this year roads with a mileage of 71,312 miles had gross earnings of \$82,000,000, or \$1151 per mile, against \$76,000,000 on

68,205 miles for the same quarter of last year, or \$1112 per mile. Considering the great strikes and the unprecedented storms last year, these returns do not represent an increase in the volume of general business in proportion to the increase in mileage, even if rates were not changed at all.

It is stated that two independent sugar refineries at Philadelphia are selling their product at 6½ cents, as compared with 7 cents for granulated, which is the price of the trust refineries. In spite of the fact that the independent refiners are paying ½ cent more for raw sugar, they are reported to be making good profits.

If the plans now before Parliament are carried out England will during the next few years spend £21,500,000 upon her navy. It appears from this that England expects not only to maintain her present naval superiority, but to keep in advance of some of her neighbors who are devoting attention to war vessels.

The successful placing of bonds for the city of New York at 2½ per cent. is giving rise to considerable comment. It is stated that it is an intimation of the fact that the interest rate on safe investments is now rather below 3 per cent. per annum, 4 per cent. mortgages being hardly available in satisfactory quantities for institutions needing such collateral.

A comparison between the English ship *Calliope* and the Trenton shows the following figures: The former had 3000 horse-power engines and 2700 tons displacement. The latter had 3100 horse-power, but her tonnage was 3900.

Dr. Wendell Prime, Prof. Theo. Wight, Dr. Howard Crosby and Geo. W. Cable addressed the New York Prison Association lately, indorsing the Fassett bill.

At the St. Louis Exposition, to be held this fall, there will be a large and comprehensive exhibition of electrical appliances. The managers have offered every inducement to manufacturers of electric apparatus and expect each branch of the science to be fully represented. There will also be provided a large hall in which exhibitors can demonstrate the operation of their appliances.

In his message to the Mexican Congress, President Diaz states that contracts now in force promise an investment in mining enterprises of more than \$40,000,000. He states that the cultivation of the vine and the breeding of the silk-worm are progressing; that the telegraph system has been developed rapidly until the total length is now 21,200 kilometers. Financially, the position of the country is growing stronger, and with continued peace a prosperous future lies before Mexico.

Congress has appropriated \$400,000 for the construction of seven dynamite guns. According to Captain Zalinski, three of these will be placed at Sandy Hook, two at Fort Schuyler and two at Fort Wadsworth.

A very large jute factory is to be built by Platt, who is connected with the Standard Oil Company, on property adjoining the refinery on Newtown Creek, Greenpoint, L. I.

Experiments made by Leutz indicated that the use of aluminium for castings when gray iron was used was often positively detrimental. Its effect upon white iron was favorable, but care must be taken to strike the right temperature, which must be low. At the proper heat no iridescence is shown on the surface of the iron, which has a greenish tinge.

The product of all the furnaces in the Upper Susquehanna Valley, Pa., in March aggregated 16,184 gross tons.

## MANUFACTURING.

### Iron and Steel.

The newly-organized Steubenville Iron and Steel Company, located at Alikanna, 3 miles from Steubenville, Ohio, made their first muck iron on the afternoon of the 9th inst. Twelve new puddling furnaces are completed, making 25 in all. The company own about 140 acres of coal property, and as soon as the pumping out of the mine is finished it will be operated.

Gabel, Jones & Gabel, lessees of the Norway Furnace, at Pottstown, Pa., have recently struck a blue vein of iron ore of very excellent quality at Boyertown. Work on the new and second shaft which has resulted in this find was started in August, 1886. Black ore was struck in June of 1888 at a depth of 638 feet. The blue vein was struck on Thursday, the 4th inst., in a gangway driven out from the shaft proper to an estimated length of 320 feet, of which the actual length is 317 feet. This new vein is regarded as a good quality of ore and is the larger of the two. The total depth of the new shaft is 658 feet.

During the month of March, Rosena, a furnace at New Castle, Pa., made 5875 tons of No. 1 foundry pig iron, which amount is said to be 58 tons more than has ever been made in one month by any furnace in either the Shenango or Mahoning valleys.

A press dispatch from Chambersburg, Pa., under date of the 11th inst., says: "The Falling Spring Furnace here, which has been idle for five years, has been purchased by C. Burkhart & Co., who will put it in blast about July 1. The furnace of the Mont Alto Iron Company has also been put in blast."

Sarah Furnace, at Ironton, Ohio, made 303 tons of foundry pig iron week before last. This is the largest output for one week in the history of the furnace.

From a recent issue of the Ironton, Ohio, *Register* we take the following: "Messrs. Warner, the coke men, and Moore, the Bath County ore man, are in town trying to negotiate for the lease of big Etna furnace. We understand that there is a probability of a lease being made. Sarah Furnace is also included as a part of the lease."

With the exception of the tack factory all the departments of the La Belle Iron Works, at Wheeling, W. Va., closed down on Wednesday, the 10th inst., for an indefinite period.

The iron building department of the Shiffler Bridge Works, of Pittsburgh, Pa., J. W. Walker, proprietor, has recently completed for the Jefferson Iron Works, Steubenville, Ohio, an extension to their cast house, and has now on hand an extension to the cast house of Shoenberger, Speer & Company, of Pittsburgh.

The new furnace of the Jefferson Iron Works, at Steubenville, Ohio, was blown in on Tuesday, the 9th inst. It is 17 feet at the bosh and 81 feet in height and was erected by J. P. Witherow, engineer and contractor, of Pittsburgh. It was built to replace an old stack and has a capacity of about 150 tons per day.

The entire plant of the Penn Iron Company, Limited, at Lancaster, Pa., has been closed down for an indefinite period, on account of the iron market.

Notwithstanding reports to the contrary, the rail mill of the Allegheny Bessemer Steel Company, at Duquesne, is only being operated single turn. The rail-straighteners and others in the finishing department went on a strike several weeks

ago, refusing to accept the scale of wages offered by the firm. New men have been engaged, but not a sufficient number as yet to operate the plant more than single turn. The following agreement is presented to each employee for signature before entering into the firm's employ: "I do hereby pledge and bind myself, on my word of honor, not to join any labor organization while in the employ of this company, and also to give two weeks' notice to the company before leaving."

The Pennsylvania Tube Works, of Pittsburgh, have received an order from the Standard Oil Company for 100 miles of 8-inch pipe.

The Otis Iron and Steel Company, of Cleveland, Ohio, are erecting a forge 30 x 60 feet, which will contain eight hammers.

We are informed that the report that Cartwright, McCurdy & Co., of Youngstown, Ohio, were about to lease and put in operation the Himrod Furnace at that place is without foundation.

Carnegie Brothers & Co., Limited, of the Edgar Thomson Steel Works, at Braddock, Pa., are considering the question of erecting an additional blast furnace at that place, to cost in the neighborhood of \$200,000. Furnaces A and Y will shortly be blown out for extensive improvements. A new converter and other appliances that are to be put in this summer will considerably increase the output and cause a demand for more iron. This will make the erection of another furnace a necessity. At present the firm are operating seven blast furnaces at Braddock, six of which are running on Bessemer and the other on spiegel.

The Brooke Iron Company, of Birdsboro, Pa., have resumed work in their nail factory.

At a meeting of the stockholders of the Charlotte Iron Works Company, at Rochester, N. Y., a proposal was made to establish cast-iron pipe works. Although the project has been regarded favorably, no definite action was taken in the matter pending another meeting, which is soon to be held. The following officers were elected for the coming year: President, George B. Smith; vice-president, A. G. Yates; secretary and treasurer, A. S. Clarke.

The Plymouth Rolling Mill, of Conshohocken, Pa., have made an assignment to A. A. Lindsey, of the same place.

The Swindell & Smythe Company, Lewis Block, Pittsburgh, Pa., have just completed the following contracts: At the Kansas City Bolt and Nut Company, Kansas City, Mo., they put in an 18 x 7 feet regenerative gas mill heating furnace and artificial gas-producing plant, the capacity of furnace being more than sufficient to keep a 10-inch train running continuously, the gas being made from the commonest slack coal. For the McConway & Torley Company, Pittsburgh, they built six annealing furnaces, 8 feet 6 inches wide, and an open-hearth melting furnace for foundry purposes, which are running with natural gas; they also built a large regenerative gas open-hearth melting furnace and artificial gas-producing plant for the Lobdell Car-Wheel Company, Wilmington, Del., which is used for making car-wheels and heavy castings. The regenerative gas-annealing furnaces they have put up for Henry Disston & Sons, Philadelphia, Pa. (for which they have applied for a patent) are doing good work. They are annealing the plates, so that they are able to dispense with the die furnaces altogether. Both sides of the saw-plates are annealed at the same time by their improved arrangement. They have remodeled the pipe mill for the Riverside Iron Works, Wheel-

ing, West Va., putting in their gas-producers to take place of natural gas, which was used formerly in this mill, and have also built for them one large lap-welding furnace, and one lap-weld bending furnace. For the Kelly & Jones Company, Greensburg, Pa., they built the entire brass melting plant, both open-hearth and crucible melting furnaces being used. The plant of Benjamin Atha & Co., Newark, N. J., has been entirely remodeled by them, their gas-producing apparatus being adopted throughout. They also built the 30-pot crucible steel melting furnaces, and a large mill heating furnace, which takes the place of five small ones, which were used previously. For the Addyston Pipe and Steel Company, Cincinnati, Ohio, they set three batteries of boilers and applied artificial gas to some of them. They also built the entire plant for John Illingworth & Co., Newark, N. J., consisting of 30-pot crucible steel melting furnaces, a gas-producing plant and several large and small mill heating furnaces. For the Johnson Foundry Company, Johnstown, Pa., they have put in a 15-ton air melting furnace, for making rolls, &c. The following plants they have closed contracts for are in the course of construction: For the Columbia Iron and Steel Company, Uniontown, Pa., they are building a 10-ton open-hearth steel melting furnace, and for the Montreal Rolling Mill Company, Montreal, Canada, they are making additions to their mill, by putting in additional gas-producing plant and two improved mill heating furnaces, and they have contracted with the Ramel-Conley Iron and Steel Company, Brewsters, N. Y., to put in for them a complete steel plant, consisting of open-hearth steel furnaces, artificial gas-producing plants, ladles, casting pits, cranes, cars and everything complete, ready to put the plant in operation.

### Machinery.

The firm of McGill, Manchester & Co., general machinery manufacturers, at Pittsburgh, have been dissolved, and all the property and effects of the company have been assigned to J. J. McGill and Chas. E. Salter, who have reorganized under the firm name of McGill & Co., and will continue the business at the old location on Smallman street, in that city.

The Westinghouse Electric Company, of Pittsburgh, have just issued, in pamphlet form, a full list of patents controlled by that corporation.

Mackintosh, Hemphill & Co., proprietors of the Fort Pitt Foundry, at Pittsburgh, have already commenced to rebuild that portion of their works which was destroyed by fire on the 27th ult.

While pouring a heat to make a 4000-pound casting in the foundry of William Tod & Co., at Youngstown, Ohio, on the 11th inst., it exploded, hurling the molten metal in every direction. A number of the workmen were seriously injured, but no lives were lost.

The Springfield Iron Works, Springfield, Mass., have recently added new machinery and greatly increased the capacity of their forging department.

E. E. Garvin & Co., Lighthouse and Canal streets, this city, have extended an invitation to those interested to inspect their new factory on April 30.

Messrs. D. H. and F. M. Merritt, of Marquette, have completed with the West Duluth Land Company an arrangement for the removal to Duluth of the Iron Bay Mfg. Company, now located at Marquette, Mich. The works make Corliss engines, mining machinery, hoisting engines, general foundry castings and boilers of all styles, marine and stationary. They have been in business there many years and have worked up a trade with the Michigan iron



ranges, the Gogebic and the Vermillion, and the silver and copper mines of Montana, besides a very large general business. The company will have a paid-in capital of \$300,000. The West Duluth Land Company have agreed to raise \$90,000, to be paid in when the enterprise is moved. The business of the concern will be managed by D. H. Merritt, who is made president and treasurer, and Frank Wilbur Merritt, secretary and general manager; C. Markell, vice-president. Directors are as follows: D. H. Merritt, F. M. Merritt, Capt. Jos. Sellwood, O. H. Simonds, C. Markell. There will be seven distinct buildings, besides oil-house, fire-cistern, engine-house and stack. All will be of brick and all but the machine shop and pattern-house will be one story high. The machine shop will be two stories, with one end raised to three for office and other purposes. It will be 60 x 275 in ground plan, with an office at the end fronting on Fourth avenue east 20 feet deep, making the entire side length of the building 295 feet. Built up close to this, and at right angles with it, will be a structure 260 feet long and 60 feet wide, the first 60 x 60 feet of which will be a blacksmith shop, while the remaining 200 x 60 feet, stretching along Fourth avenue east, will be a general foundry. Close behind this will be a pattern shop, 40 x 60 feet, and a coal and sand house, also 40 x 60. Across a clear space and near the east end of the long machine shop will be the boiler shop, also 60 feet wide and 150 feet long. Further down toward the slip will be a two-story pattern-house, practically fire-proof and 60 x 100 feet, and a general storehouse, 40 x 85 feet. Built up against the machine shop will be two buildings, each 30 x 40 feet, in one of which will be located the engines and boilers of the establishment.

#### Hardware.

Excelsior Mfg. Company, Birmingham, Conn., makers of edge tools, will soon erect a new factory at Shelton, Conn. The new structure will be of brick, 280 x 40 feet and three stories high.

Champion Blower and Forge Company, of Lancaster, Pa., are meeting with an excellent demand for their Champion self-feed upright blacksmith post drill. A representative from *The Iron Age* visited their place of business a few days ago, and from the daily mail just received was shown letters containing orders from New York, Pennsylvania, Ohio, Indiana, Michigan, Illinois and Texas.

The Ludlow-Saylor Wire Company, St. Louis, Mo., have furnished the ornamental artistic metal-work for the Exchange Bank, Franklin, Pa.

The Sequatchee Hoe and Tool Company, South Pittsburg, Tenn., have contracted for such additional machinery as they will need for the manufacture of shovels.

C. E. Hudson, Leominster, Mass., has been putting in special automatic machinery for the manufacture of apple parers, and otherwise increasing his facilities for turning out better work and cheaper than ever before.

W. G. Avery, president of the W. G. Avery Mfg. Company, Cleveland, Ohio, has received notice from the Commissioner of Patents for Canada that a Canadian patent was issued to him April 2 covering elevator buckets, welded, brazed and fused.

The strike at the Ames Shovel Works, of North Easton, Mass., which lasted seven weeks, has been settled.

#### Miscellaneous.

The Savage Fire-Brick Company, of Pittsburgh, who have for six months been shipping large quantities of brick to Birmingham, Bessemer and other Alabama points, have just secured a contract from

a new furnace company at Sheffield for 2,500,000 bricks. These will cost \$50,000 at the manufactory.

The Chas. Munson Belting Company, of Pittsburgh, have received an order at their Chicago branch house from the Minnesota Brush Electric Light Company, at Minneapolis, for 140 feet 68-inch, 60 feet 86-inch and 70 feet 80-inch leather belting. The 68-inch belt, it is claimed, is the largest leather belt made in this country.

A press dispatch from Findlay, Ohio, under date of the 12th inst., says: "Two enormous gas wells were struck here today, one with a capacity of over 80,000,000 cubic feet and the other with not less than 20,000,000 feet. The former is owned by the city.

Reports from South Pittsburg, Tenn., are to the effect that the different manufacturing concerns there are taxed to their utmost to fill orders, and the city is regarded as growing on a firm basis. Electric lights are being put in, an additional pump is being added to the water-works, and other enterprises are progressing.

Randolph & Clowes, who began business about two and a half years ago in a portion of the old mill of the late firm of Brown & Bras., Waterbury, Conn., have recently purchased the remainder of the plant, consisting of a number of buildings, covering nearly 8 acres. This acquisition will more than double the capacity of Randolph & Clowes, and will be used to extend the production of seamless drawn brass and copper tubes and patent seamless drawn copper house boilers, and for the rolling of brass and copper for all purposes. The recently purchased buildings are almost bare of machinery, most of the old equipment having been sold some time since, so that Randolph & Clowes will have an opportunity of putting in the latest improved machinery and appliances, which they purpose to do. At present there are in their works several hydraulic machines of great capacity, operated by a great pump and an accumulator, weighing 70 tons, and costing from \$10,000 to \$25,000 each. The new portion of the plant will be in running order in a few months.

The Canton Steel Roofing Company, Canton, Ohio, are now doing business and completely settled in their new plant, which is referred to as exceptionally complete. They report an increase of business during the first quarter of the year of more than 30 per cent. over last year.

Among new corporations recently authorized in the State of Illinois are the following: Sampson Steam Forge Company, Chicago; capital, \$100,000; for the manufacture of locomotive frames and general forging; incorporators, S. R. Wilson, F. J. Smith, J. W. White and F. J. Wilson. The Chicago and Minnesota Ore Company, Chicago; capital, \$2,000,000; for mining, transporting, reducing and refining iron and other ores, dealing in securities, corporations, and other personal property; incorporators, Charles P. Coffin, Austin W. Grenville and Arthur C. Elis.

The National Tube Works Company, McKeesport, Pa., report that they have sold over \$8,000,000 worth of their kalamined pipe since the patents were issued. This pipe is used for a variety of purposes, principally water, oil and gas. There are 5900 men at present in the employ of the above company, and their works comprise 60 acres under cover. The daily output is 1000 tons of finished product, including standard steam, gas and water pipe, boiler tubes, &c.

Evans & Howard, St. Louis, Mo., favor us with a recently-issued catalogue of fire-brick, gas retorts, &c., St. Louis standard

sewer-pipe, &c., which they manufacture. In an introductory note to the trade they direct special attention to their 9-inch brick cupola blocks, tiles and shapes, of which they keep a large stock on hand. They own their bed of fire-clay and have exceptional facilities for distributing their product by rail. They also refer to their two large factories for the production of sewer and culvert pipe. In addition to the goods mentioned the catalogue illustrates cost prices of furnace linings, paving brick, drain tiles, well tubing, chimney-flue pipe, &c.

The Johnstown Steel and Iron Casting Company, of Johnstown, Pa., manufacturers of steam and hot-water radiators, have been in existence for about two years. The company is composed entirely of business and professional men who cannot give the business the necessary attention, and they have decided to lease the plant with the full equipment. It is located at Sheridan Station, on the line of the Pennsylvania Railroad, and is said to be in good condition in every respect.

#### Brazilian Trade.

The anomalous condition of American trade with Brazil is the subject of discussion in Rio papers, with the object of showing that while Brazilian products as a rule are admitted into the United States either free or at a low rate of duty, the Brazilian Government makes no corresponding concessions. The *Rio News* says: "While the United States has voluntarily abolished all duties on coffee, rubber, hides and horns and many medicinal plants, all products of Brazil, and is even considering the question of reducing or abolishing duties on sugar—another Brazilian product—here in Brazil the duties on American products have been rigidly maintained, in some cases at an unjustly high figure. And while the United States takes over half the coffee produced in Brazil, considerably over half of the rubber product, fully half of the hides and horns exported, and about two-fifths of the sugar crop—or, in the aggregate, about one-half of the entire exports of the country—the imports from the United States into Brazil barely reach one-seventh of the total importation. This certainly is not an indication of reciprocity in trade, nor of an overpowering sentiment of friendship and neighborly interest. Although repeated complaints have been made, kerosene still pays from 140 to 160 per cent. customs duties on its cost, lumber nearly 90 per cent. and lard 52 per cent, while a great percentage of American imports, such as furniture, cotton, linen and woolen fabrics, hardware, cutlery, clocks, hams, butter, &c., pay over 50 per cent. on cost and freight." It is a curious circumstance that the one monarchy on this continent should be especially favored by the United States in its commercial relations, rather than countries like Mexico, with whom it would most naturally sympathize as a sister republic.

The Water Bureau of Philadelphia awarded contracts for cast-iron pipe as follows: To the Mellert Foundry and Machine Company, of Reading, 20-inch pipe, 1½¢ cents per pound; 30-inch pipe, 1½¢ cents per pound for the first 600 lengths and 1.24¢ for the second 600; small specials, 2¼¢ cents a pound; large specials, 2½¢ cents per pound; to Daniel L. Dawson, breeches-pipe, 3½¢ cents per pound. The contract for large specials was divided between Dawson and the Mellert Company.

A sample taken from a pile of magnetite ore, approximating 400 tons of New Bed ore, at Mineville, in the Lake Champlain district, N. Y., to get at an average, showed by analysis 72 per cent. of iron and 0.018 per cent. of phosphorus.

# The Iron Age

New York, Thursday, April 18, 1889.

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## The Outlook for Lead.

The statistics for the production of lead recently published by the United States Geological Survey are instructive because they show how hopeless was the struggle of speculators last year to maintain high prices in the face of a very large increase in the output, and because they indicate that for the near future there is little hope for an advance in the price over present figures. In fact, the question may well be raised whether under certain circumstances lower figures are not probable.

For ten years the make in the United States has been as follows:

*Production of Lead in the United States, Net Tons.*

Year.	Desilverized.	Non-argentiferous.	Total.
1878.....	64,290	26,770	91,060
1879.....	64,650	28,180	92,780
1880.....	70,185	27,690	97,825
1881.....	86,315	30,770	117,085
1882.....	108,975	29,015	132,590
1883.....	122,157	21,800	143,957
1884.....	119,975	19,962	139,937
1885.....	107,457	21,975	129,412
1886.....	114,329	20,800	135,629
1887.....	136,562	25,148	160,706
1888.....	151,465	29,080	180,555

The desilverized lead is that produced in the Rocky Mountains containing silver and subsequently specially treated to extract the silver and refine the lead. With the exception of a small quantity, which is bought by the refiners for special purposes, the lead produced in Missouri and Kansas does not go through the same channels, roughly speaking. The principal increase, it will be observed, is in desilverized lead, carrying the 1888 product to double the figures reached a decade since. The production of late years has probably been unjustly credited to the United States. Since 1886 an important percentage of it is really the produce of Mexican miners whose ores are shipped to smelting works in the United States for treatment. The magnitude of this business for 1886 is not known. For 1887 it was estimated at 15,000 tons, while for 1888 an official report of the Bureau of Statistics shows the lead contents of Mexican ores imported to have been 28,636 tons of 2000 pounds. Deducting this from the figures given for the production of desilverized lead, we find that the American product was 120,000 tons in 1887 and 123,000 tons in 1888. With the non-argentiferous lead added, the yield of the mines in the United States was roughly 145,000 tons in 1887 and 152,000 in 1888. In other words, our domestic supply has not developed very rapidly.

A widespread agitation exists throughout the Rocky Mountain camps and among the Missouri and Kansas miners against the continuance of imports of Mexican ore, and manufacturers and dealers in white lead, sheet lead, pipe and shot should

closely watch developments in the coming struggle, since the decision reached is likely to have considerable influence in shaping the course of the metal for years to come. A peculiar condition of affairs has led to the development of the imports on a large scale of lead in Mexican ores. Like the majority of mines in the Rocky Mountains, some Mexican ores carry both lead and silver. Under our tariff silver ore is duty free, while lead in ore pays 1½ cents a pound. The delicate question naturally arises when an ore containing both metals ceases to be a lead ore and becomes a silver ore. Following its general practice, the Treasury Department has held that the classification must be guided by the decision which is the component of greater value. If, therefore, a lead ore imported happens to have enough silver in it to make its contents of the precious metal figure out to be of greater value than the lead, then it comes in free.

It is under this ruling that the large quantities of the baser metal have entered to compete with the domestic product. Two large smelting plants have been built at El Paso to treat these ores, and the American railroads that have pushed into Mexican territory have derived a large revenue from their transportation. Naturally a vigorous protest has arisen, especially since the speculation collapsed last October under the pressure of this very supply, and prices have materially declined. Colorado, Utah, Idaho and Montana are deeply affected by the matter, especially the latter, with their allied railroad interests. During the past two years the Cœur d'Alène district in Idaho, once the scene of a mad stampede for gold placers, had developed more substantial and lasting wealth in its argentiferous lead mines. It is estimated that in 1888 the district shipped ore and concentrates whose metal contents aggregated not less than 22,000 tons. Additional railroad facilities have been provided and are being supplied, and more concentrating works are building, so that local authorities promise an output of not less than 30,000 tons, and possibly 33,000 tons, of metal providing adequate prices for lead can be secured. Montana has a deep interest in these developments, because the new State is to do the smelting, two large works having been built during 1888, one at Great Falls and the other at Helena. Thus far the new Idaho district has done little more than fill the gap caused by the decline in some of the other Rocky Mountain States and Territories, but the miners and smelters naturally fear that if Mexico continues to crowd the market their own development will be checked, if not imperiled.

It is true that the latest advices are that the new railroads which have connected Gulf ports in Mexico proper with the mining regions in that country are encouraging the export of the ore to Europe, and that for that reason an important diversion is taking place. But it remains to be seen how long the European markets are going to stand up against the promised influx of lead from the new Australian mines. Should that prove to be serious, then the current may flow back into the same channels which it has occupied during the past year. With Idaho in the Northwest and Mexico in the Southwest rushing lead into our markets, and the

older Colorado and Utah districts striving to hold their own, the supply of lead promises to be very ample—too large, in fact, to allow of any advance, and tending rather to aid a further decline. Should the efforts of those succeed who are eager to stop the free importation of Mexican lead as silver ore, then matters would assume a very different aspect. The balance would then tend decidedly to swing in the other direction. It is for this reason that those in any way interested in the metal should watch for any developments in Washington.

## The Advance of Steel.

There is much food for study in the statistics just published by James M. Swank, general manager of the American Iron and Steel Association. What is particularly interesting is his repetition of an effort to secure data concerning the quantity of steel rolled for other purposes than rails. This is, of course, the principal though not the only factor in the question as to what extent steel has superseded iron. Mr. Swank has followed his usual method of computation, as follows:

	1887. Net tons.	1888. Net tons.
Bessemer steel ingots.....	3,288,857	2,812,500
Less 12½ per cent. for oxidation and crop ends.....	411,045	351,563
Finished Bessemer steel....	2,877,812	2,460,937
Steel rails, except from purchased blooms.....	2,290,197	1,529,832
Steel not in rails.....	587,115	931,105

Mr. Swank has compiled similar figures for a series of years, as follows:

	Net tons.
Bessemer Steel not Marketed as Rails.	
1882.....	150,045
1883.....	198,974
1884.....	231,400
1885.....	414,435
1886.....	478,907
1887.....	587,115
1888.....	931,105

To this, of course, must be added the output of finished goods from open-hearth steel, and that rolled from imported slabs, blooms and billets. The product of open-hearth steel was 352,036 net tons, equal, using the same system, to 303,770 net tons. Add about 26,000 tons of steel hoops and sheets, 100,000 tons of blooms and billets and 90,000 tons of steel wire rods imported, and a total is reached of about 1,450,000 net tons. Last year we estimated the consumption, in a similar manner, at 1,300,000 tons. In 1888 the American works displaced about 210,000 tons of foreign material and captured an increase of 150,000 tons.

Now, in 1887 the total of rolled iron was 2,588,500 net tons, as compared with 2,411,654 net tons in 1888, a decline of 176,846 tons. In other words, steel displaced iron to the extent of about 150,000 tons, and drove out foreign material to the extent alluded to.

Mr. Swank has this year again presented details of the production of rolled steel, which have been rendered more complete by the collection of statistics concerning the production of wire rods. He makes the total of rolled steel 1,201,885 net tons, including 216,174 tons of cut nails, 213,694 tons of plates and sheets and 772,017 tons of other rolled steel. The latter, of course, includes 298,770 net tons of steel wire rods, the total production of rods, by the way, having been 313,341 net tons. The consumption was considerably greater, including as it did about 26,000 tons of

imported plates and sheets, and at least 90,000 tons of foreign wire rods, drawn at barb-wire and wire-nail works.

#### Brazilian and Argentine Finances.

Of all the South American countries Brazil and the Argentine Republic are progressing most rapidly at present, and unless something unforeseen happens may continue to do so for some years to come. In May last year slavery was abolished in Brazil, field labor being disorganized thereby very little except in the cultivation of current food supplies, so that in all this year large amounts of Indian corn will have to be imported from the United States and of rice from Burmah. No disorders were caused by the freedmen anywhere; they picked the coffee crop, though slovenly, and if 80,000 tons less of sugar were produced in 1888 than in 1887, it was due to the drought and not to a lack of plantation hands. Instead of procuring Chinamen and Indian coolies to take the place of any negroes who might flock to the cities, the coffee planters of San Paulo and other localities situated in the mountain district liberally facilitated European immigration, following therein the example of the Argentine Republic. From an average immigration of 27,390 a year for ten years, the figures leaped in 1888 to 180,000 in the two ports of Rio and Santos alone. This year their number may swell to 200,000. The Argentine Republic received last year 175,000, and it is believed more than 200,000 may be looked for in the current year. What troubles the Argentines, however, is that so small a portion of the immigrants—only about 10 per cent.—devote themselves to agriculture. They see clearly enough that it is only the rapid development of their natural resources that can enable them to pay for the vast system of internal improvements now under way. Over 5000 miles of railway were under construction last year, and 3000 more are planned for 1889; but this means an addition of \$75,000,000 to the national debt. Ten thousand houses were built in Buenos Ayres in 1888, and the city has now a population of nearly 500,000, but this means, just as does the enormous premium on gold, feverish commercial speculation. So strongly does the Government feel that more labor is wanted, not for railroads and harbors, but for farms, that it is seriously proposing to restrict immigration, of Italians at least, to those who will give themselves to agriculture.

The public indebtedness of the Brazilian Government last year was 2,831,128,631 milreis, of 54 cents American. The budget for 1889 estimates the expenditures at 173,415,408 milreis and the revenue at 247,200,000, resulting in a deficit of 26,215,408 milreis. The real cause of the recurring deficits has been the heavy outlay on schemes of internal improvement, principally on railroads. If the debts of Brazil are greater than those of either Chili or the Argentine Republic, so is the foreign commerce, so is the national income, and so in many respects are the public resources. With all the wealth of the country pledged to pay its debts, and with a most honorable record of punctual fidelity to its obligations in the past, it is not surprising that Brazilian bonds have such an excellent footing in London, or that the adminis-

trators of Brazil's finances look forward so confidently to a prosperous future.

On March 31, 1888, the consolidated Argentine national debt amounted to \$140,355,772, against \$147,791,257 on March 31, 1887. The outlay last year was \$51,086,536 and the income \$53,743,800. The spirit of enterprise in the republic probably reached its climax in 1888, when during the first 11 months—without counting banks and railroads—no less than 51 stock companies were formed, with an aggregate capital of \$73,000,000. During the first 10½ months Europe absorbed last year £28,702,766 in the shape of Argentine loans of all sorts, national, provincial, municipal, railway, &c. The Netherlands Bank has declined to advance any money on Argentine securities. During the ten years between 1877 and 1887 the following items showed the percentage of increase set against each: Income of the State, 375; foreign commerce, 260; sea-going vessels entered, 324; area under culture, 500; value of crops, 360; telegraphs, 324; railroads, 330; immigration, 385; bank capital, 315; paper money in circulation, 247; public debt, 180; annual interest thereon, 160. Brazil cannot show a similar percentage of increase in the items named, because it had the incubus of slavery on its shoulders. Now that the latter is out of the way and coffee and sugar command high prices, all this is likely to be changed.

If only a portion of the work under construction which the *Railway Age*, of Chicago, reports in a special article, widely quoted, were taking iron and steel, our markets would have a very different complexion. Our contemporary figures out that during the first three months in the present year "the work of railway construction or inception has been going on in the name of 666 companies, representing a contemplated mileage of over 53,400 miles, of which over 14,800 appear to be at the present time under construction or under contract for gradual completion." The iron trade will receive this pleasing information with much amazement and some incredulity. The rail manufacturers particularly, who flatter themselves that they keep their thumbs very near the pulse of the patient, will be startled. Perhaps they are able to supply information which will take much of the elasticity from the buoyancy of our contemporary. It has been remarked again and again by nearly every leading manufacturer of rails in the country, in interviews with representatives of *The Iron Age*, that there are a good many inquiries in the market, but, as one of them put it, the majority of them are "cats and dogs." If rail-makers were to take bonds by the ream prettily printed in exchange for good metal they could fill their order books for a year to come. The most amazing propositions come to them, to be dismissed with a shrug or a smile, and the chase for *bond fide* business goes on as vigorously as ever. We hear of offers to take rails from a mill singled out by the discriminating buyer, provided the manufacturers will advance a trifle of \$10,000 or \$15,000 per mile to finish the grading. Then the generous builder will give the contract at \$26 at mill in exchange for long-time notes indorsed by the projectors and backed by bonds as collateral. The rail mills are not doing business in that

way, and until it becomes very much clearer than it is now where the money is to come from to carry on the mileage "under construction" iron and steel manufacturers will remain very conservative.

#### The Rise in Sugar.

For a year past the consumption of sugar has been gradually outrunning production; this fact was pretty generally known and the position of the staple all along inspired confidence, yet speculation was held in check by the rather abundant yield of beet root on the Continent of Europe in 1888. If the cane-producing countries in America and India had turned out their usual quota, a notable appreciation in the value of the staple might perhaps have been avoided, but it so chanced that the September cyclone in Cuba curtailed that crop a couple of hundred thousand tons, that Brazil had a shortage of 90,000 tons and that the small West India islands were backward and also produced less. While the United States were thus compelled to fall back on Java, Manila and beet-root sugar in Europe for the want of a sufficient supply from Cuba and Pernambuco, England had to buy beet sugar (for the lack of colonial cane sugar) on the Continent, where a group of speculators had got partial control of the market. Meanwhile, in spite of higher prices, this country consumed last year over 10 per cent. more sugar than in 1888, and has this year continued at the same rate. On April 11 the stock on this coast at the four ports had thus dwindled down to 19,083 tons, against 105,289 at the same date last year. In Cuba the available sugar is also held by speculators, and the price they dictate has to be submitted to. Last week five Spanish steamers were chartered to take some of this sugar to New York, Philadelphia and Boston. This shows how pressing the demand must be. At the lowest point last year fair refining Cuba was sold in New York at 4½ cents; it now commands 6¼ cents. On April 1 the visible supply in Europe and America, Cuba included, was 1,026,061 tons, against 1,309,168 in 1888 and 1,467,669 in 1887. Our greatest consumption is during the summer months. Should there be a bountiful fruit crop our requirements will be very large unless checked by excessively high prices, which for aught we know may rule by that time. With the grip which the Sugar Trust has on the market the outlook for consumers is anything but pleasant under the circumstances, but those who speculate in Sugar-Trust certificates have some cause for feeling bullish.

A good many people in the iron trade seem to be puzzling over the question why the steady advance in prices abroad has not a direct effect upon our drooping markets. The fact is forgotten that, after all, the influence of foreign markets upon our own is really only negative, that prices abroad influence ours only when our production is unable to supply the demand, except at a heavy advance, or when the markets in Europe are relatively much weaker than ours. For some time past conditions have been unusual. In former years the first impulse in an upward movement came from this side of the Atlantic. Lately the rise there has taken place in spite of an absence of a demand from us. Their own and other countries throughout the world have been buyers to such an extent that the gap

caused by the falling off in orders from us has not alone been filled, but there has been business beyond that. The result has been that they have been independent of us, and that we have not been influenced by them. Home competition with us is alone responsible for driving prices to present low figures. The foreign markets have had nothing to do with it. We cannot hope for an improvement of any moment until the demand has developed notably or production has been lessened by the exhaustion of weaker concerns. The only possible source of uneasiness which the present condition of the foreign markets may cause, so far as the more distant future is concerned, is that the boom abroad may collapse by the time we have reached the turning point. That is a contingency which it is hardly worth while discussing now.

### The Charcoal Furnaces April 1.

The current product of the charcoal furnaces throughout the United States fell off in March, and the plants entered April with a lessened production. Thus, although the same furnaces were at work in Michigan, the March product was only 15,189 gross tons, as compared with 15,365 gross tons in February, a month shorter by three days. In detail the record is as follows:

Charcoal Furnaces April 1.

Location of Furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	7	560	7	530
New York.....	10	3	412	7	530
Pennsylvania.....	23	22	115	21	969
Maryland.....	8	3	183	5	451
Virginia.....	28	1	42	27	904
West Virginia.....	3	0	0	3	184
Ohio.....	18	6	436	12	842
Kentucky.....	2	0	0	2	155
North Carolina.....	2	1	70	1	70
Tennessee.....	9	2	614	7	1,280
Georgia.....	2	1	60	1	54
Alabama.....	10	0	1,780	1	200
Michigan.....	25	11	3,430	14	3,370
Minnesota.....	1	0	0	1	180
Missouri.....	3	2	580	1	180
Wisconsin.....	10	4	1,580	6	810
Texas.....	1	0	0	1	173
California.....	1	0	0	1	120
Washington.....	1	1	175	0	0
Oregon.....	1	1	181	0	0
<b>Total April 1.....</b>	<b>187</b>	<b>53</b>	<b>10,173</b>	<b>114</b>	<b>10,956</b>
<b>Total March 1.....</b>	<b>187</b>	<b>55</b>	<b>11,081</b>	<b>112</b>	<b>10,981</b>
<b>Total Feb. 1.....</b>	<b>187</b>	<b>62</b>	<b>11,219</b>	<b>105</b>	<b>10,406</b>
<b>Total Jan. 1.....</b>	<b>189</b>	<b>67</b>	<b>11,946</b>	<b>102</b>	<b>9,822</b>
<b>Total Dec. 1.....</b>	<b>189</b>	<b>71</b>	<b>12,286</b>	<b>98</b>	<b>9,397</b>
<b>Total Nov. 1.....</b>	<b>189</b>	<b>73</b>	<b>12,724</b>	<b>98</b>	<b>8,941</b>
<b>Total Oct. 1.....</b>	<b>175</b>	<b>71</b>	<b>11,619</b>	<b>104</b>	<b>9,083</b>
<b>Total Sept. 1.....</b>	<b>176</b>	<b>67</b>	<b>11,243</b>	<b>109</b>	<b>10,004</b>

In New York Copake is again at work, and since the 1st two stacks have blown in in Pennsylvania. In the Hanging Rock region of Kentucky both furnaces are now idle, Bellefonte having stopped on the 18th ult.; to put in a new hearth and a Player hot-blast stove, which it is expected will be completed by May 1. In Maryland Muirkirk is again out. In Virginia Reed Island resumed on the 15th ult.; Walton is getting ready; Beverly and Cedar Run are to follow early in May, and Foster's Falls in June. In Ohio Bloom is again a producer, having had a good start. Mount Vernon is to blow in at an early date. In the Northwest Hinkle continues its brilliant record, having made 3004 gross tons in 31 days. In Alabama Round Mountain resumed, and Gadsden has begun work since the 1st. Tecumseh suffered from a stoppage of 16 days during March. In Texas the Old Alcalde blew out during March.

Reports from every furnace in the Mahoning Valley, Ohio, show the product to have been 38,506 tons in March.

### Our Iron and Steel Production in 1888.

Mr. James M. Swank has just published his annual statistical report for the American Iron and Steel Association, of which he is manager, the following table showing the production of the leading iron and steel products in 1888, in comparison with the figures for the three preceding years:

Net tons of 2,000 lbs. (Except nails.)	1886.	1887.	1888.
Pig iron.....	6,365,328	7,187,206	7,268,507
Bessemer-steel ingots.....	2,541,493	3,238,377	2,812,500
Bessemer-steel rails.....	1,763,667	2,364,152	1,562,681
Open-hearth steel ingots.....	245,250	300,717	362,086
Open-hearth steel rails.....	5,255	19,208	5,261
Crucible-steel ingots.....	80,009	84,421	78,713
Rolled iron, except rails.....	2,259,943	2,565,438	2,397,402
Iron rails.....	23,679	23,062	14,252
Kegs of cut nails—100 lbs.....	8,160,973	8,908,870	6,493,591
Pig, scrap & ore blooms.....	41,908	43,306	30,875

The total production of pig iron in the United States in 1888 was 7,268,507 net tons, or 6,489,738 gross tons, the largest yearly production ever attained in this country, exceeding by 72,590 gross tons the extraordinary production of 1887. The total production in 1887 was 7,187,206 net tons, or 6,417,148 gross tons. The production in the first half of 1888 was 3,382,508 net tons, and in the second half it was 3,886,004 net tons, or 3,020,092 and 3,469,646 gross tons respectively.

In the following table the production of pig iron in 1888 and in the three preceding years, classified according to the fuel used, is given in net tons:

Fuel used. Net tons.	1886.	1887.	1888.
Bituminous.....	2,075,686	3,806,174	4,270,635
Anthracite and coke.....	1,176,477	1,655,851	1,919,640
Anthracite alone.....	277,913	443,746	418,749
Charcoal.....	309,844	459,567	578,182
<b>Total.....</b>	<b>4,828,899</b>	<b>6,365,328</b>	<b>7,187,206</b>

For a series of years the production in this country and the estimated consumption were as follows, in gross tons:

Production.	Consumption.
1881.....	4,144,254
1882.....	4,623,328
1883.....	4,596,510
1884.....	4,067,888
1885.....	4,044,826
1886.....	5,633,329
1887.....	6,417,148
1888.....	6,489,738

The following table shows the production of Bessemer-steel ingots, the output of steel by the Clapp-Griffiths process being added in the totals and given separately also under it:

Ingots.	First half 1888. Net tons.	Second half 1888. Net tons.	Total 1888. Net tons.	Total 1887. Net tons.
Pennsylvania.....	749,993	862,636	1,592,629	1,752,445
Illinois.....	321,115	299,741	620,856	837,513
Other States.....	383,180	295,635	678,815	678,899
<b>Total.....</b>	<b>1,384,288</b>	<b>1,428,212</b>	<b>2,812,500</b>	<b>3,268,857</b>
Clapp - Griffiths only.....	36,070	45,087	81,157	68,679

The proportion of steel rails of the whole was very much smaller than usual, the figures standing as follows:

Rails.	First half 1888. Net tons.	Second half 1888. Net tons.	Total 1888. Net tons.	Total 1887. Net tons.
Pennsylvania.....	420,101	491,105	911,206	1,221,289
Illinois.....	256,823	231,816	488,639	728,526
Other States.....	98,357	31,650	129,987	340,382
<b>Total.....</b>	<b>775,281</b>	<b>754,571</b>	<b>1,529,852</b>	<b>2,290,197</b>

An interesting set of figures is added to show the output of the Chicago and Pittsburgh districts, the rivalry between them making the comparison of special interest:

Counties.	1887. Gross tons.		1888. Gross tons.	
	Ingots.	Rails.	Ingots.	Rails.
Cook County, Ill.	531,064	439,845	373,106	302,722
Allegheny County, Pa..	518,694	287,363	451,127	154,882

It may be added, however, that the current year, with its comparatively full work thus far at the Edgar Thomson plant, and the addition of the Allegheny Bessemer on the one hand and the relative idleness of the Chicago mills on the other, is likely to reverse the figures in favor of Pittsburgh.

The production of open-hearth steel fell off slightly during 1888, the decline, however, taking place almost exclusively in the Western and Southern States, while Pennsylvania again forged ahead. The figures printed below show the production for a series of years:

Years.	New England, New York and New Jersey.	Pennsylvania.	Western and Southern States.	Total. Net tons.
1880.....	23,293	48,003	41,657	112,953
1881.....	29,600	63,363	53,968	146,931
1882.....	30,436	67,322	61,794	160,552
1883.....	30,904	69,368	43,442	133,679
1884.....	16,700	81,501	38,416	131,617
1885.....	18,268	94,966	36,220	149,381
1886.....	23,882	172,144	49,724	245,750
1887.....	18,442	270,710	71,565	360,717
1888.....	13,677	285,738	52,621	352,036

The enormous increase which has taken place in Pennsylvania since 1885 is probably due entirely to the use of natural gas as a fuel, which has led to the rapid development of open-hearth steel manufacture, notably in the Pittsburgh district. Since 1885, it will be observed, the make has trebled.

The production of bar, rod, bolt, hoop, skelp and shaped iron and rolled iron axles in 1888 amounted to 1,819,585 net tons, against 1,917,403 tons in 1887, a decrease of 97,818 tons, or 5 per cent. Pennsylvania made over 46 per cent. of the total production of these forms of iron in 1888, against nearly 48 per cent. in 1887; Ohio made nearly 19 per cent. in 1888, against 17 per cent. in 1887, 1886 and 1885.

The production of plate and sheet iron in 1888, excluding nail plate, amounted to 469,312 net tons, against 477,056 tons in 1887, a decrease of 7744 tons. Pennsylvania made 76 per cent. of the total production in 1888, against over 75 per cent. in 1887, and Ohio made nearly 13 per cent. in 1888, against over 11 per cent. in 1887.

Mr. Swank also gives the output of street rails, the quantity rolled in 1888 being 50,345 net tons, all of which, except 2000 or 3000 tons, were made of Bessemer steel. In 1887 the quantity rolled was 57,362 tons, while in 1886 the quantity produced was 48,009 tons.

It is stated that water gas is gaining in favor as a fuel for open-hearth furnaces in Germany and Austria. Hoerle has been running with water gas for some time, and at Witkowitz, Austria, it is also introduced. At the latter place the air is heated to from 1200° to 1400° Celsius, and yet the gas of combustion escaping from the regenerators carries only 400° to 500° Celsius. The furnace produces 20 tons of steel a day, the consumption of gas being 60 cubic meters per 100 kg. of steel, which is equivalent to about 400 pounds of coal per gross ton of ingots, or about 47 per cent. of the fuel consumption of the ordinary furnace fired with producer gas.



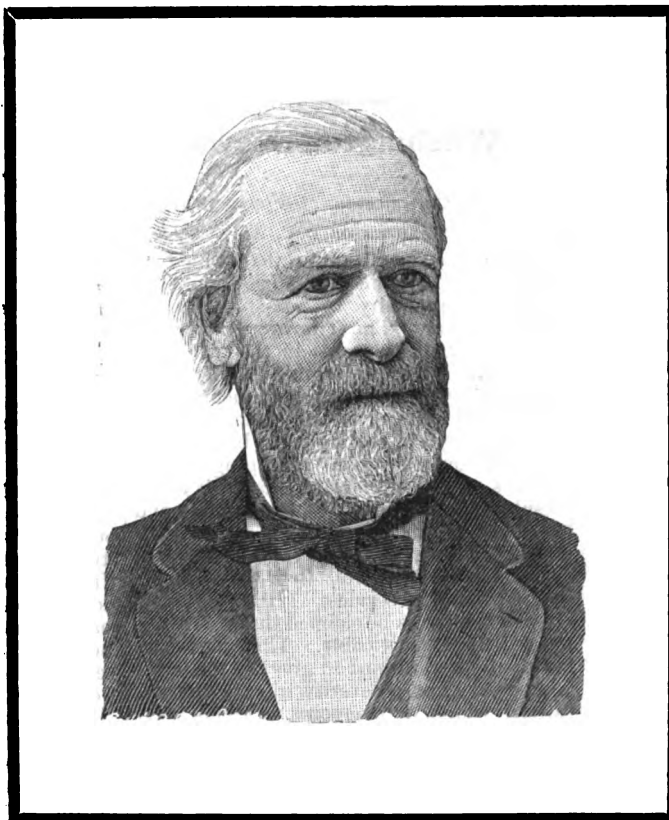
## Edward P. Allis.

The death of Edward P. Allis, of Milwaukee, which occurred on the 1st inst., after a very brief illness, removes from the manufacturing interests of the Northwest one of their most prominent representatives. In his lifetime he had built up a small concern, known as the Reliance Works, with but a limited local business, into a vast establishment, employing 1500 workmen and sending its products all over the civilized world. He was a typical American, born and educated in the East, but entering the arena of business activity in the more promising West. He was born at Cazenovia, N. Y., on May 12, 1824, and was educated with a view to the practice of law, graduating from Union College, Schenectady, in 1845. Preferring an active business life to the professional career which had been mapped out for him, he located in Milwaukee in 1846, and opened a leather store in connection with William Allen, the style of the firm being Allis & Allen. They built a large tannery at Two Rivers, Wis., and conducted an extensive business, terminating their connection in 1854, when Mr. Allis sold out his interest in the firm and entered the real estate and brokerage business in connection with John P. McGregor. In 1860 those two gentlemen and Charles D. Nash concluded to purchase the Reliance Works, which had been established by Decker & Saville about 13 years previously, and consisted of a small stove foundry and machine-shop. The owners had failed in 1857, and the works were taken by the creditors and were being run under the management of S. S. Daggett when the transfer of proprietorship above noted was made.

The true business career of Edward P. Allis dates from the day when he became one of the owners of the Reliance Works. He had faith in their future, and did not hesitate to show it by his actions when his partners concluded to withdraw from the enterprise. He purchased their interests, became sole owner and assumed personal control and supervision of every detail of the establishment. In 1865 his business had so increased through his energetic efforts, indomitable perseverance and sagacious management that he was obliged to look for larger quarters, and the present site was selected for new works, being about a mile from the old location on West Water street. From year to year these works constantly expanded, until at the time of his death Mr. Allis stood at the helm of the largest manufacturing concern of its kind in the world, doing a machinery business of over \$3,000,000 per annum. The phenomenal development of these works is to be attributed solely to him. He called able lieutenants to assist him, but it was with the full knowledge that their special training and attainments were required in order to accomplish purposes which he himself had foreseen were essential. He was therefore one of those exceptional men endowed by nature with special facilities

for leadership. He knew how to manage other men. No employer ever had the welfare of his workmen more constantly in mind. He was at all times approachable and ready to listen to claims of right and justice or even ambition, recognizing and rewarding ability and rebuking favoritism. It can safely be asserted that no employer has held the warm admiration and loyal support of his workmen in greater measure than Mr. Allis.

Mr. Allis always occupied a prominent position in the social and business circles of Milwaukee, and his loss is keenly felt by that city. He was a fine scholar and a patron of art, having one of the choicest collections of paintings in the West. He took a lively interest in the questions of the day, and kept abreast of the scientific and mechanical developments of the age. He was quiet in his manner, simple in his



EDWARD P. ALLIS, OF MILWAUKEE, WIS.

Born May 12, 1824; Died April 1, 1889.

tastes and inclined to be reticent but positive in his convictions, and ready at all times to back up his opinions with cogent reasoning. In 1877 he was the Greenback candidate for Governor of Wisconsin, and lifted that party to a position of influence in State politics which was held for several years. In 1888 he returned to the Republican party, and took an active interest in the campaign, influenced by his belief in the policy of protection. The great works which were built up by Mr. Allis will continue their operations on the lines laid down by him and which have proved to be so successful. Several of his sons are interested in the establishment, and have already demonstrated their superior business qualifications.

Some idea of the violence of the storm through which the men-of-war were wrecked at Apia may be gained from the fact that the Calliope could only make half a knot an hour, although she is rated as a 15-knot ship.

## The National Lead Trust.

Considerable interest is being taken in Wall street and in the metal trade in the movement of Lead-Trust stock. The name is hardly well chosen, since the company has only a moderate interest in pig lead, so far as product is concerned. Last year a company was formed, embracing a lead smelting works at Socorro, N. M., the refinery of the St. Louis Smelting and Refining Company and a number of St. Louis white lead works. At the time the movement attracted considerable attention, but was lost sight of subsequently. One by one a number of large white lead manufacturing plants in the United States were taken into the trust, a valuation being made of the plant and trust certificates to the extent of four times that valuation issued in payment therefor. It is estimated that from 50 to 60 per cent. of the white lead productive capacity of the country is now controlled by the trust, which then succeeded in inducing all the leading independent manufacturers, with the exception of one, in joining a pool based on the allotment plan in white lead. The result has been an advance in that commodity to a minimum of 6 cents a pound in the largest quantities and to an average of about 6½ cents on all sales. At the same time the advantage to the St. Louis refinery was the fact that it always had secured to it a market, a large proportion of the product being shipped to Eastern members of the trust. The refinery itself has developed its production in a very rapid manner, it being estimated that it is likely to produce this year close upon 30,000 tons of refined lead. It is urged in behalf of the trust that outside competition is not so readily developed in white lead, since a very large amount of working capital is needed and the introduction of a new brand of the pigment is difficult. Wall street has taken an interest in the matter since the report that capitalists identified with the Standard Oil Company have been heavy

buyers of Lead-Trust certificates for some time past; that the trust is making large quantities of money, and is likely to increase its earnings as soon as the present comparatively high-priced stock of raw material purchased before the break of last fall is worked up.

F. Valton reports in the *Génie Civil* that Alexander Pourcel has succeeded at the new basic open-hearth steel works of Bell Brothers, of which Sir I. Lowthian Bell is a member, in producing from Middlesbrough pig carrying 1.7 per cent. of silicon and as much phosphorus, steel with as low as 0.03 per cent. of phosphorus. The lining of the furnace is chrome ore.

We understand that an official invitation has been sent by the Council of the American Institute of Mining Engineers to the British Iron and Steel Institute to hold the autumn meeting of 1890 in the United States.

**The Tennessee Coal, Iron and Railroad Company.**

The annual report of this, the largest coal and iron company in the South, for the fiscal year ending January 31, 1889, has been made for the meeting of the stockholders which was held on the 1st inst. The retiring president, Mr. Nathaniel Baxter, Jr., makes the following statement in regard to the production of the different departments of the company:

Division.	1887-88. Tons.	1888-89. Tons.
Tracy City, coal.....	426,274	413,631
Tracy City, coke.....	155,253	154,414
Cowan, pig iron.....	24,540	18,112
South Pittsburg, pig iron...	43,564	56,779
South Pittsburg, coal.....	15,266	73,699
South Pittsburg, coke.....	4,014	26,346
Birmingham, pig iron.....	41,068	47,770
Birmingham, coke.....	64,071	79,786
Pratt Mines, coal.....	718,824	888,247
Pratt Mines, coke.....	106,649	196,059
Ensley, pig iron.....		78,089
Inman Mines, iron ore.....	107,750	126,271

Total output.	1887-88. Tons.	1888-89. Tons.	Increase. Tons.
Coal.....	1,160,364	1,375,577	215,213
Coke.....	329,987	456,805	126,818
Pig iron.....	109,160	200,750	91,590
Iron ore.....	107,750	126,271	18,521

In order to provide working capital and yet not delay the completion of the Ensley furnace plant, the proposal was made to the stockholders to sell the company \$830,000 of stock at 30 cents, and to buy \$1,000,000 from the company, at 90 cents, of stock having a cumulative 8 per cent. preference dividend attached to it. This operation was carried out, netting \$642,157.72, after deducting the expenses incident to issue, sale and listing. The common stock of \$9,000,000 is held by 259 persons, while 92 are on the books as holders of the \$1,000,000 8 per cent. preference stock. The fixed charges, according to the statement of Jas. Bowron, secretary and treasurer, are \$420,050, including 6 per cent. on \$5,156,200; 7 per cent. on \$1,015,000, of which \$6,007,800 are in circulation. The sinking funds call for 1 per cent. on \$3,640,000 and 1½ per cent. on \$1,279,200. There is to be deducted 6 per cent. on \$236,000 held by the trust company for exchange. This makes the total fixed charges payable \$420,050, of which \$343,557.29 are chargeable to profit and loss, leaving \$76,492.70 available for reduction of the bonded debt in 1889. In October, 1886, the company entered upon a scheme of enlargement and development, to which there was a total disbursement of \$2,154,234.86, the totals being as follows:

	Oct. 1, 1886, to Jan. 31, 1888.	Feb. 1, 1888, to Jan. 31, 1889.	Total.
At the Ensley division.....	\$377,631.39	\$421,255.54	\$1,098,886.98
At the Pratt Mines div....	499,367.39	172,745.76	672,103.15
At the South Pittsburg division.....	290,107.56	41,348.99	331,456.55
At the Bir- mingham division.....	Cred. 69.43	3,110.05	3,040.62
At the Tracy City div.....	7,356.90		7,356.90
Ch'd through Nashville books.....	42,422.42	Cred. 881.71	41,540.71
Totals.....	1,516,806.23	637,628.63	2,154,434.86
Less credits at Cowan div.		200.00	200.00
Final totals	1,516,806.23	637,428.63	2,154,234.86

The undivided balance brought forward from the preceding year was \$404,747.38. The aggregate profits from the year's business and the sale of preferred stock amounted to \$1,223,250.14, a total of \$1,627,997.52. After paying interest ag-

gregating \$836,696.98 and a dividend of \$40,000 on the preferred stock, a balance remained to credit of profit and loss of \$1,251,800.55. In detail the profits of the fiscal year on the different divisions were:

Tracy City division.....	\$127,878.12
Cowan division.....	7,174.23
South Pittsburg division.....	27,641.88
Birmingham division.....	76,381.58
Pratt Mines division.....	213,288.76
Ensley division.....	213,728.35
	\$666,062.42

The Pratt Mines division shows the heaviest profit on the coal account of \$170,738.33, while the principal profit on the Ensley division is, of course, on pig iron, of \$202,851.23 on a product of 78,089 tons. The Birmingham division shows a profit of \$75,282.91 on 79,786 tons of pig iron, while at the Cowan division, where the product was 18,112 tons, the profit on pig iron was \$2659.24. South Pittsburg, with an output of 56,779 tons of pig iron, is credited with \$13,563.70 profit thereon. The Tracy City division, including the Inman Mines and the Tracy City coke furnace, is credited with \$83,583.47 on an output of 126,271 tons of ore, and \$29,972.02 on 154,414 tons of coke.

**Washington News.**

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 18, 1889.

The ordnance officers are determined not to lose any grounds for a thorough test of the adaptability of cast-steel guns to warlike work. The Thurlow gun, which met with better success in the firing test than the Pittsburgh gun, having gone through with the first requirements, both firing and gauge, is now charged with showing signs of scaling in the bore, which was discovered upon regauging. The friends of the gun claim that this is the result of some defect in the casting, and does not impair the strength of the gun. It is proposed, however, to subject it to a more severe firing test than would be required in actual service. If the gun bursts it will doubtless be claimed that the whole system is impracticable. The officers are evidently determined to give the theory of cast-steel guns a severity of experimental strain which, if overcome, will not only place this class of guns in high favor, but will simplify and cheapen gun construction.

Secretary Windom has determined upon a practical solution of the tariff question. It is his intention, as soon as the personnel of the customs service has been organized, to place in the hands of the collectors of customs at certain leading importing cities of the country a copy of the Senate tariff bill, with instructions to apply its provisions to the customs service in actual practice. The Secretary says that the tariff question has now been one of long agitation, and unless settled in some practical way will continue for an indefinite time to agitate and disturb the industries of the country. It is his purpose to give particular attention to the workings of the schedules of metals, wool and woollens, silks and cotton fabrics. The metal provisions of the Senate tariff bill are very elaborate. This schedule, under which there has been so much appeal and litigation, will be put to a thorough trial.

The Secretary has not determined whether he will make the results of this inquiry the basis of a special report on tariff revision in his own communication to Congress, or whether a bill will be formulated and submitted to the Administration leaders of the House for introduction and reference to the Committee on Ways and Means. The prominent Republicans who are in the city, and particularly Senator Allison, who had charge of the Senate bill, think that the Secretary's plan is an

excellent one, and will co-operate with him in his effort to solve the tariff problem. The Secretary, as every one knows, is a strong Protectionist. He believes in fostering the tin-plate, wire and wire-rod and cotton-tie industries, and various other branches of metallurgical interests, to the utmost extent of sagacious legislation.

Captain Howison, president of the Steel Inspection Board, is engaged in preparing schedules and instruction for the corps of inspectors of material which will be used in construction of the additional vessels of the navy authorized by Congress. The meeting of the president of the Inspection Board, the chief constructor, engineer-in-chief and representatives of the manufacturers, while it afforded an opportunity for an exchange of ideas, resulted in no change of plans as contemplated. It was found that the inspections of boiler plates and material for use in the ships at the navy-yards would not answer the purpose. The manufacturers were unwilling to assume the responsibility. They preferred to have a representative of the Government inspect the materials and progress of manufacture and the results at the works before the material was subjected to the additional expense of transportation. The duty of an inspector is very severe. It has been the subject of complaint by officers, which led to the attempt of the Secretary to change the method of inspection. The officers are required to examine the material when being prepared, to see it placed in the furnaces, to watch its treatment, to see it run into ingots and to follow every subsequent stage in order to have a complete record of the physical properties and chemical attributes of the product. In the indorsement on the report of the board, the Secretary authorized the continuance of inspections under the old rules.

Captain Howison says that the report of the results of test is not entirely completed, but when it is it will show the wonderful strides made by the steel producers of the United States since the system of inspection was inaugurated. The inspection of material for the new ships was never in a more efficient condition, and results are being achieved which in the beginning were regarded as impracticable.

Naval constructors, engineers and ordnance officers are anticipating with marked interest the completion of the Herreshoff torpedo-boat which is being constructed for the Navy Department. If the claims of the constructors are realized this small craft will be one of the most destructive engines of naval warfare afloat, and with the dynamite cruiser will place the American navy in possession of two methods of offense which will not be exceeded by any navy in the world. The boat is 137 feet long, 14½ feet beam and 8 feet depth of hold. She will have a secondary battery of two 6-pounders, machine guns, and not less than 20 knots per hour speed. Her boilers and engines possess great power. The vessel is constructed in eight watertight compartments. The torpedo shutles on either side of the boat are so placed as to be protected by the turtle-back of the forward part of the boat. The contract price is about \$83,000, and a bonus of \$1500 extra for each quarter knot made in excess of 23 knots. It is expected that the trial of this diminutive but formidable craft will take place in about a month. Naval officers, who are waiting for the debut of the craft with great interest, will send a large representation to witness her performance in Newport waters when the trial takes place.

The Dominion Customs Department has decided that the rate of duty on sheet brass, plain, stamped or figured, cut into narrow strips, shall be 30 per cent. ad valorem.

### The English Compound Locomotive.

Some time since the Pennsylvania Railroad Company brought from England a duplicate of one of the engines which had made such remarkable runs on the London and Northwestern road. The engine was assembled at the Altoona shops and is now being tested. In order that the test of the engine should be as favorable as possible an engineer familiar with its construction and operation was brought from the other side and placed in charge. The new locomotive is a compound, has two high-pressure cylinders placed outside and one low-pressure inside. The two pairs of driving-wheels are unconnected, and are driven, one from the high-pressure and the other from the low-pressure cylinder. The two high-pressure cylinders receive steam direct from the boiler, use it expansively and drive the two trailing wheels. From there the steam passes to the low-pressure cylinder, which is placed under and behind the smoke-box. Here it again expands and drives the forward pair of wheels. The steam then escapes through the smoke-stack. The engine weighs, when in working order, 95,200 pounds, the tender, when empty, weighing 27,000 pounds. The driving-wheels are 6 feet 3 inches in diameter. The high-pressure cylinders are 14 by 24 inches, and the low-pressure 30 by 24 inches. The low-pressure cylinder slide-valve is placed above the cylinder, while in the high-pressure cylinders the steam-chests are beneath them, this construction being adopted to allow the valves to drop off the face of the chest when the engine is running but not using steam.

An interesting account of a ride on this engine is given by a representative of the *Railroad Gazette*, who notes some of the peculiarities of the engine as compared with the American type. We quote as follows:

At starting the rear drivers are allowed to slip a few turns until the low-pressure cylinder has a supply of steam at a pressure of 40 pounds, as shown at the gauge connected with the receiver. The valve motion regulating the steam admission to the low-pressure cylinder is almost always run at full gear. This gear is operated by a separate reverse lever not unlike our own type. The valve gear for the high-pressure cylinder is operated by means of a screw and wheel with a handle attached, as the custom is on English locomotives. The location of the cut-off point is shown by an index finger on the screw itself. Soon after starting the initial pressure in the large cylinder drops to 30 pounds. At this time the locomotive is exerting sufficient power to slip all of the wheels. The weight upon drivers being about 65,000 pounds, the pull upon the draw-bar must be considerable. One of the most noteworthy features of the action of this engine, and one which should give us all "food for reflection," is the action of the fire under the infrequent blasts from the exhaust nozzles. The number of blasts in a given time is just one-half of those from the common locomotive having the same size of drivers and running at the same speed. The reason of this is that there is only one low-pressure cylinder. With these infrequent blasts, and with a low force of blast scarcely audible in the cab, the fire burned brightly and supplied sufficient steam for the locomotive to exert its full power on the very steep grades at that part of the line between Altoona and Gallitzin before and after reaching the "Horseshoe Bend." This locomotive is fitted with a re-entering fire-door, and the very small amount of smoke issuing from the top of the stack showed the advantage of admitting air to the fire-box above the fire and deflecting it downward upon the bed of incandes-

cent coal. While passing around curves the engine showed no more tendency to "grind" or bind upon the track than the average American locomotive, but one could see she had been designed for very smooth roads; this was evident from the shortness of the springs and the consequent "rough riding" when passing over the proverbially good track of the Pennsylvania. The tender is a model of economical design, and presents to the mechanical department of our American railroads a design which is easily repaired, readily accessible at all times, and one which will pass curves readily and ride like a passenger car. While we do not believe that this locomotive as a whole, or in any large collection of its parts, will be adopted by American railroads as a standard design, we do think that the study of the elements of her design will lead to new inventions and prevent our own mechanics from falling into grooves of opinion, which is the way of all mankind when left to its own admiration.

The financial column of the Boston *Herald* contained the following recently: "The name of the new rolling mill to be formed by the union of the North Chicago Rolling Mill Company, the Joliet Steel Company and the Union Steel Company is the Illinois Steel Company. It is to have 11 directors, and the surplus of the various companies is to be capitalized, the total capital to be \$25,000,000. The value of the present plants, the cash surplus and new stock are thus tabulated in the official circular:

	Value of plant.	Cash surplus.	New stock.
North Chicago ..	\$7,000,000	\$2,000,000	\$2,000,000
Joliet .....	8,000,000	800,000	8,800,800
Union .....	2,750,000	800,000	3,550,000
Total .....	\$12,750,000	\$3,700,000	\$16,400,000

The Union Company have \$1,200,000 bonds out, which are to be converted into stock, and have a valuable coking plant in the Connellsville, Pa., region, which is to be purchased for say \$1,250,000 cash or stock, making the issued capital \$18,900,000, and leaving \$6,100,000 stock in the treasury. The above is the outline of the plan, which is subject to modification. The North Chicago stockholders will probably get one and one-half new shares for one present share."

One of the largest, if not the largest, wire ropes ever made for use in this country, says the *Engineer* of the 5th, was last week dispatched from the works of Dixon & Corbitt and R. S. Newall & Co., of the Teams, Gateshead. Its length is 4560 yards, and its circumference 5 inches. It weighs over 23 tons, and occupied three large railway trucks. The rope has been made for the North British Railway Company, and is to be used for drawing the trains from their Queen street station, Glasgow, to Cowairs. A wire rope has been used for this purpose some years, but this is the first one made on Lang's patent. This make of rope has been proved to be superior to any other for haulage and incline work, and we have no doubt will do credit to the makers. We understand that this firm, with a view to extend their business in the South Wales coal field, have recently established a manufacturing branch at the Windsor Rope Works, Cardiff.

A few days since dispatches from Troy announced the success of an experiment carried through at the works of the Troy Steel and Iron Company in making soft steel under a process invented by C. W. Bildt, chief chemist of the Washburn & Moen Mfg. Company, of Worcester, Mass. We learn that Mr. Bildt's process consists in a modification of the Bessemer, a special lining being used. He experimented with it some time since at Wheeling, W. Va., and, we understand, showed results fa-

vorable enough to impress Washburn & Moen with the value of the method. Not having a plant of their own, they arranged with the Troy Steel and Iron Company for carrying out experiments, upon the outcome of which was dependent a contract for a large quantity of billets. So far as we are advised, the matter has not yet progressed to a point where it is settled.

### America's Oil Supply.

An article published in the *Oil City Derrick* recently contains some statements regarding the area and character of the illuminating oil-bearing territory which should be reassuring to believers in a possible future oil famine in this country. The oil regions as now developed, the article states, "extend from Wellsville, N. Y., crossing Pennsylvania at nearly a 45° line to Dunkard Creek, in West Virginia. On an air-line this covers a distance of 204 miles in length, and, so far as developed, the belt is about 10 miles in width. The yield of the oil fields up to March 1, 1889, was 340,133,997 barrels. About 150,000,000 barrels of this came from McKean County alone, and this county is still good for 20,000 barrels a day." The total future production of this belt is beyond prediction. It has been noted, says the article, that oil-bearing rock, wherever found, usually yields about the same quantity of oil to a given acre. The yield of oil per square mile of territory during the first 15 years of its existence is about 1,000,000 barrels. It is considered certain, however, that each of the 204 square miles of territory will not yield this quantity. If it did the total production there outlined would be about 2,040,000,000 barrels. "This belt of 204 miles is a chain of pools, large and small, and until the area of each one is known the total yield would be simply conjecture."

The figures and estimates given relate only to the region where the illuminating oil of commerce is produced, namely, New York, Pennsylvania and the Mackburg district, in Ohio. The great Lima field is not taken into account, nor Colorado, California, Kentucky or Tennessee. "It has been stated that under the drill the Ohio field might be made to yield 100,000 barrels a day. This is not improbable, since the Bradford field in July, 1882, produced 105,102 barrels each day of that month. The Bradford field had no large wells compared with the geysers of Ohio. Lima oil is worth but about one-seventh as much as the Pennsylvania product, and can never come into competition with it as an illuminant, unless some new process of manufacture is discovered beyond anything now known. Its utility in the world's economy lies in the direction of fuel, and there is not much likelihood that it will ever be diverted from this field. Natural gas is the only fuel that can compete with it in cheapness, and that is not everywhere obtainable. Natural gas cannot be transported much above 100 miles, and oil fuel may be carried to the ends of the earth. As far west as Omaha it is now furnishing manufacturers a cheaper fuel than coal." With the above large supplies of oil, both for illuminating purposes and for fuel, in sight, the writer of the article apparently sees little reason to fear an oil famine, as he states it, as among the immediate probabilities.

It is stated that the annual report of the Crane Iron Company for the last fiscal year showed that on a product of 75,000 tons of pig iron the gross earnings were about \$81,500, while the net earnings were a trifle under \$25,000. It should be stated, however, that a coal strike early in the year 1888 reduced the earnings of the company by about \$90,000.

## THE FREIGHT AGITATION.

### FINISHED IRON IN WESTERN PENNSYLVANIA.

Pittsburgh manufacturers are discussing eagerly the question of freight discrimination, and a movement is on foot to thoroughly organize. We have been favored with some data which will aid in a correct estimation of the rates paid on finished iron for various distances. We compile from them the following table:

Pittsburgh Rates on Finished Iron.

Miles.	Rate.	Per ton per mile.
100.....	\$3.06	8.60
150.....	1.79	1.19
200.....	2.01	0.75
250.....	2.91	0.91
300.....	2.91	0.82
350.....	3.36	0.76
400.....	3.36	0.72
450.....	4.14	0.87

### RATES ON SOUTHERN FINISHED IRON.

A leading manufacturer in the Birmingham, Ala., district sends us the following communication:

Judging from the reiterated statements of Carnegie and the numerous articles in the iron papers in reference to the rates of freight, the uninitiated would undoubtedly conclude that the Southern industries were carefully huddled under the protective wing of the railroads of this section, and that the railroads in the North were pursuing a cutthroat policy by taxing the industries with excessively high rates of freight. With the view of correcting this erroneous impression I have compiled some data, which I hand you herewith for publication, presuming that you will extend the courtesy of your columns in your usual impartial manner. In all our experience, during nine years, we have found that to competitive points we had to pay a higher rate per ton per mile than our Northern competitors, and for several years we have been making efforts to have a just equalization.

Birmingham, Ala., Rates.

Miles.	Rate gross ton.	Per ton per mile.
24.....	\$2.24	9.33
33.....	2.24	6.79
55.....	2.24	4.07
87.....	6.04	6.98
96.....	2.10	2.19
143.....	2.24	1.56
276.....	2.46	0.89
348.....	3.02	0.87

These figures certainly show that for hauls in their own particular territory the Southern railroads develop in the most orthodox manner the principle of taking all which the traffic will bear. The rates up to 150 miles are undoubtedly outrageous.

Our correspondent draws an interesting comparison between the Pittsburgh, Youngstown and Birmingham rates to Chicago, Kansas City, San Francisco and Los Angeles, Cal., which we reproduce:

	Pittsburgh.			Youngstown.			Birmingham.		
	Miles.	Rate gross ton.	Per ton per mile, cents.	Miles.	Rate gross ton.	Per ton per mile, cents.	Miles.	Rate gross ton.	Per ton per mile, cents.
Chic..	468	\$3.40	0.73	423	\$2.91	0.69	649	\$5.38	0.83
K. C..	898	7.84	0.87	892	8.06	0.90	738	7.50	1.02
S. F..	904	25.76	0.35	2998	25.76	0.86	2943	25.76	0.91
L. A..	2701	25.76	0.94	2656	25.76	0.96	2361	25.76	1.09

Nor is our correspondent content with allowing the impression to prevail that the rates on raw material to rolling mills in the Birmingham district are low. We quote the following figures on coal, ore and pig metal; all of them, it will be observed, are short hauls:

Miles.	Rate gross ton.	Per ton per mile.
8.....	\$0.28	3.11
9.....	.28	3.50
15.....	.28	1.87

Ore.		
7.....	\$0.25	3.57
14.....	.25	1.78
Pig Iron.		
6.....	\$0.28	4.68
7.....	.08	4.00

The following comparisons are made, too, to show that the differences in the rates on pig iron are not so great as claimed, the Shenango Valley and Birmingham being placed side by side:

Comparative Rates on Pig Iron.

	Shenango Valley.				Birmingham.			
	Miles.	Rate gross ton.	Per ton per mile.	Cents.	Miles.	Rate gross ton.	Per ton per mile.	Cents.
Chicago....	475	\$2.20	\$0.45		649	\$3.95	\$0.61	
Evansville..	550	2.50	.45		362	2.71	.75	
Indianapolis.	381	1.80	.44		504	3.21	.63	
Green Castle	419	2.20	.52		537	3.70	.69	
East St. Louis	506	2.50	.41		525	3.21	.61	

### RATES IN WESTERN PENNSYLVANIA AND OHIO.

Since the last issue of *The Iron Age* we have gathered additional figures. One of the most interesting documents in question dealing with short hauls is the Special Freight Tariff No. 124, issued by the Pennsylvania Company, which went into effect on January 14 of this year, covering shipments of pig iron, blooms, billets, muck bar, scrap iron and steel, skelp, native ore, cinder, scale, coal and coke in carloads between all stations Rochester to Leetonia, Newcastle to Shenango, all stations on the N. C. and B. V. R. R. all on the P. Y. and A. Ry. The rates in question are:

Distance.	Pig iron, blooms, muck, scrap, skelp.	Native ore, scale and cinder.	Coal.	Coke.
	Per gross ton.	Per gross ton.	Per net ton.	Per net ton.
Under 10 miles.....	Cts. 25	Cts. 25	Cts. 30	Cts. 30
10 and under 15 miles....	30	30	35	35
15 and under 20 miles....	35	35	40	40
20 and under 25 miles....	40	38	45	50
25 and under 30 miles....	45	40	50	55
30 and under 35 miles....	50	40	55	60
35 and under 40 miles....	55	45	60	65
40 and under 45 miles....	60	45	65	70
45 and under 50 miles....	65	50	70	75
50 and under 75 miles....	80	70	80	85

In the last issue of *The Iron Age* we printed figures bearing chiefly on a short haul on pig iron. Below we give data relating to rates on greater distances east and west for the Mahoning and Shenango valleys.

Rates on Pig Iron, Mahoning and Shenango Valleys.

Distance.	Rate gross ton.	Per ton per mile.
Miles.		Cents.
175.....	\$1.20	0.68
189.....	1.85	0.07
251.....	1.85	0.77
260.....	1.60	0.62
265.....	1.95	0.73
266.....	2.20	0.74
332.....	2.45	0.74
353.....	2.45	0.69
380.....	2.50	0.70
398.....	2.70	0.68
405.....	2.20	0.54
412.....	2.70	0.66
415.....	2.90	0.70
448.....	3.10	0.69
478.....	2.70	0.58
530.....	3.20	0.60
600.....	2.50	0.41
622.....	3.50	0.56
651.....	4.30	0.63
700.....	4.20	0.60
800.....	4.30	0.54

On distances of over 250 miles the rate therefore ranges within wide limits between 0.41 and 0.77 cent per ton per mile.

On partly-finished articles, like muck bar, wire rods, billets and blooms, we compile the following rates for Western Pennsylvania:

Rates on Muck Bar, Billets, Wire Rods, &c.

Distance.	Rate gross ton.	Per ton per mile.
Miles.		Cents.
8.....	\$0.40	5.00
40.....	.91	2.27
46.....	.80	1.74
66.....	.95	1.44
157.....	2.91	1.85
160.....	1.68	1.05
172.....	2.24	1.30
224.....	2.64	1.18
262.....	2.39	1.10
262.....	2.64	1.01
640.....	4.92	0.77
680.....	5.15	0.76

Here, too, the hauls for moderate distances between 50 and 200 miles are altogether too high, and should be very materially reduced.

It is interesting to compare these data with the rates paid on different hauls on pig iron east of the Allegheny Mountains by manufacturers in that section. We give the figures below:

Rates on Pig Iron in the East.

Distance.	Rate.	Per ton per mile.
Miles.		Cents.
5.....	\$0.30	6.00
8.....	.45	5.60
12.....	.35	2.91
14.....	.45	3.21
15.....	.50	3.33
16.....	.45	2.81
30.....	.50	2.50
42.....	.50	1.19
49.....	.60	1.23
56.....	.75	1.28
65.....	.90	1.38
69.....	.80	0.87
74.....	.80	0.81
85.....	1.35	1.59
86.....	.85	0.99
93.....	.90	0.97
105.....	2.24	2.18
100.....	.75	0.75
100.....	.90	0.90
110.....	1.17	1.06
112.....	1.25	1.11
126.....	2.00	1.59
136.....	2.00	1.47
140.....	1.40	1.00
151.....	2.00	1.32
164.....	1.20	0.73
190.....	2.00	1.08
216.....	1.20	0.56
234.....	2.00	0.85
262.....	2.86	1.09
365.....	1.50	0.41

It is only too evident from this table that there are amazing irregularities in the freight rates paid on pig iron, and that with a very few exceptions they are disproportionately high. It is clear that whatever may be the grievances of the manufacturers in other sections, the producers of Eastern Pennsylvania have more to complain of. On short hauls on ore and coal very heavy tolls are exacted. Looking over the whole field, and we have only gone over part of it, there is crying need for reform. The spirit with which manufacturers in different parts of the country have been met by railroad managers has been exasperating in the highest degree. At a recent conference held in Pittsburgh an official high in power in the Pennsylvania Company took the ground that if the pig-iron producers could not pay existing rates of freight they had better close down their furnaces until they could. Again and again have railroad managers appeared incapable of understanding that they must afford relief or lose a very large traffic. They seem to cling to the notion that because work has continued thus far it will go on indefinitely; that the freight carried for iron-makers is particularly suitable to compensate for money thrown away in wild competition on long hauls of other goods by burdening upon it high locals. A radical change is necessary in the method, or rather the lack of method, pursued by railroad managers. Broader, fairer views must prevail or all interests must suffer.

Thomas M. Jones, of the firm of Jones & Laughlins, and brother of B. F. Jones, died on Saturday last, aged about 60.



# TRADE REPORT.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 18, 1889.

**Pig Iron.**—The market does not show much rallying power, although there is a general feeling that prices cannot possibly recede below their present level. There is a great deal of hesitancy nevertheless; partly because of the shutting down of mills here and there, and partly because of unfavorable advices from the West and South. The outlook is very much mixed, making it almost impossible to form any definite idea of what the next turn in the market will be, or when it will be. Developments of an unfavorable character would certainly be met with a decided curtailment of output, which of course would lead to a stiffening in prices, but in spite of that, the market continues feverish, unsettled and if not weak, it is surely far from being strong. A great deal will depend on the outcome of events during the next 30 days. There must either be an increased demand, or a decreased production—not that there is any serious overproduction, but there are too many that are trying to sell for forward delivery. That is, bids are being solicited, although it is by no means certain that they would be accepted to anything like the extent that might be inferred from the urgency with which offers are sought for. This of course has reference more particularly to outside Irons. Standard qualities hold their position very fairly, but anything new or at all doubtful as to quality is hard to place, unless concessions of more or less importance are submitted to, and unfortunately this class of Iron seems to exercise a considerable influence at present. There is a great deal in the general outlook that is very encouraging, but as yet it is all in the future, while for the time being things are about as dull as they have been at any time during the year. Prices remain about as quoted last week—viz., \$17.50 @ \$18.50 for good to choice Pennsylvania brands of No. 1; \$16.50 @ \$17 for No. 2, and \$15 @ \$15.50 for Gray Forge. Southern Irons are offered delivered in consumers' yards at \$14.75 for Gray Forge, \$16 @ \$16.50 for No. 2, and \$17 for No. 1, but there is very little doing, except in low grades, at prices which are not made public.

**Blooms.**—The market is dull, but there is something doing all the time at about the figures quoted as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 3/4 "Bloom" ton of 2464 lb.

**Muck Bars.**—There is less disposition to quote prices, except for immediate delivery. Sellers ask \$27 delivered, and it would be difficult to secure fair-sized lots for less, providing that quality was all right. There are buyers at \$26.50, but no sales of any amount have been made recently.

**Bar Iron.**—Business remains in a most unsatisfactory condition, and, if changed at all since last week, it is not for the better. The absence of orders from large consumers is specially noticeable, so that there is quite a probability of some leading mills being shut down until business improves. There is something doing, of course, but not nearly sufficient to keep the mills running on a paying basis. Prospects are not encouraging either, and, while every one feels that the present condition of affairs cannot last much longer, manu-

facturers are getting tired of waiting and talk seriously of shutting down, rather than pile up stock for an uncertain market. The demand for Skelp Iron has also dwindled away to a mere nothing, so that, from whatever point of view the position is regarded, it is unsatisfactory. Prices, therefore, are greatly demoralized and hardly quotable except in a general way at from 1.75¢ to 1.80¢, subject to all sorts of concessions, according to circumstances.

**Plate and Tank Material.**—In this department there is a perceptible improvement. The leading mills are nearly all full for the next three or four weeks, while the number of inquiries denote continued activity. Prices are still down at the lowest for years—probably the lowest on record—but another couple of weeks' business like the last two would certainly lead to an advance. In fact it would be difficult, if not impossible, to duplicate some of the recent purchases, as sellers feel that prices are entirely too low. Quotations, therefore, are nominally unchanged, and for small lots are about as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 3 1/2¢.

**Structural Material.**—There is more doing in this department, and a better feeling prevails both as regards the present and the future. Specifications on old contracts are coming in quite freely, while the amount of work in prospect is very encouraging. Prices remain at a low point owing to the large productive capacity and to the eagerness with which their new business is competed for. Still, things are undoubtedly improving, and a little further on it is hoped that prices will begin to sympathize. Meanwhile quotations are nominally as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet Iron.**—There is a fair demand, and mills are running full without accumulating much stock. Prospects for the spring trade are thought to be favorable, and the following schedule of prices is well maintained:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, 1/2¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 1/4¢
Best Soft Steel, Nos. 21 to 24.....	3 1/2¢
Best Soft Steel, Nos. 25 to 26.....	3 3/4¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, 1/2¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67 1/2 %

**Steel Rails.**—The market is a mystery, considering the general surroundings. Prices are now within about a couple of dollars per ton of those quoted in foreign markets, and yet there are no indications of our markets moving in sympathy. Inquiries are about as usual, but the amount of business taken from week to week is very disappointing. Prices are nominally \$27.50 @ \$28, at mill, but it is not unlikely that these figures are being shaded, although in this market buyers admit that they find prices very firm.

**Old Rails.**—Business remains in a most uninteresting condition, with nothing whatever doing in this market. Small lots are wanted at about \$24 @ \$24.25, delivered to consumers in the interior, but there are very few that can be worked in at those figures. Lots for shipment are offered at \$23.50, with buyers at \$22.50.

**Scrap Iron.**—The offerings are light, so that prices are maintained at the figures recently quoted, with a fair inquiry for

lots delivered at outside points. Quotations nominally as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—There is a good demand, and with prospects of continued activity, prices are steady at the following discounts: Butt-Welded Black, 55%; Lap-Welded Black, 65%; Butt-Welded Galvanized, 45%; Lap-Welded Galvanized, 55%; Boiler Tubes, 62 1/2 %.

**Nails.**—There is no improvement to notice in this department. It is rumored that the attempt to form an agreement to restrict production has been abandoned, but as about one-third of the mills are idle, stocks are greatly reduced. Prices, however, are demoralized, and for carload lots are quoted all the way from \$1.80 to \$1.85, according to brand. Lots from store of good quality, are held at \$1.90 @ \$2, with a somewhat increasing demand.

## Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, April 15, 1889.

A very quiet week has been experienced in nearly every branch of the Iron trade. The paucity of sales has not been for lack of drumming, but consumers seem to be well supplied for the present and concessions on former prices do not tempt them, especially when the demand for their own productions seems to be declining. The remaining half of the month of April promises to be even quieter than was the first half.

**Pig Iron.**—Transactions have been quite limited since our last report. Sellers of Southern Coke Iron are holding on to this market with grim determination in competition with local Iron, and occasionally capture an order. They seem to have better success in this respect than the representatives of Ohio furnaces. Outside of the Blackbands but a very small quantity of Ohio Iron is now able to reach the yards of Chicago consumers. The demand for Strong Neutral Foundry Pig is growing on the Pacific Coast, and inquiries are being received from that market by Ohio furnacemen. Lake Superior Charcoal is slightly weaker, a low sale of a small lot under special circumstances being used as a lever to depress prices. Cash quotations are as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, \$17 @ \$17.50; Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, all numbers, \$19 @ \$19.50; American Scotch (Blackband), No. 1, \$18.50 @ \$19; Southern Coke, No. 1 Foundry, \$16 @ \$16.25; No. 2 Foundry and No. 1 Soft, \$15.50 @ \$15.75; No. 3 Foundry, \$15 @ \$15.25; Gray Forge and No. 2 Soft, \$14.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18.

**Bar Iron.**—A little more movement has occurred in the direction of Car Iron, but competition for this business is sharp. None of these orders are very large, however, the most important covering the requirements for but 600 cars. In other channels of consumption business has not been heavy, and prices are barely sustained. Quotations on carload lots of Common Iron from mill still range from 1.60¢ to 1.65¢, half extras, f.o.b. Chicago, with concessions on large orders. Store trade is quite brisk at 1.80¢ @ 2¢, according to quantity and quality.

**Structural Iron.**—There is a continued active demand for Beams in small quantities, but other shapes are quiet. Prices are as last reported.

**Plates, Tubes, &c.**—The boiler-makers are running out of work, and are consequently buying less material, which causes quite a shrinkage in the volume of business. Plate manufacturers are soliciting orders with increased vigor, but they are getting little encouragement in this market. Prices are unchanged.

**Sheet Iron.**—Nothing of special importance has occurred in Black Sheets, mill lots of No. 27 Common for early delivery being quoted at 2.95¢ @ 2.95¢ f.o.b. Chicago, and small lots from store at 3.10¢ @ 3.20¢, with light sales. Some large buyers of Light Sheets, fearing a dispute over wages may cause mills to shut down during the summer, have placed orders for delivery in the latter part of June at 2.85¢, at mill, for No. 27. Galvanized Iron has subsided from its recent active movement into a state of decided dullness, and manufacturers' agents are anxiously looking for orders, with the usual effect of weakening prices. Small lots of Juniata are quoted at 65 % off and Charcoal at 65 % and 2½ % off.

**Merchant Steel.**—Store trade is excellent, but large orders are not looked for until after the 1st of May. Prices continue about the same as previously quoted, an occasional cut being made by manufacturers anxious to get a greater share of current business. The makers of syndicate Steel reduced prices on the 4th inst. ½¢ @ 1¢ on Moldboards, Landsides and Shovel Blades, and ¼¢ on Shares and Slabs, the schedule now being as follows, f.o.b. Pittsburgh, four months, or 3 % off in 30 days, subject to a rebate of ½¢ @ 1¢ upon delivery of the first 10 tons: Slabs, 7¢; Moldboards and Landsides, 7¼¢; Shovel Blades, round or diamond point, 7¼¢; Shares, parallel sides, 7¼¢; ditto, not parallel sides, 9¢; ditto, for Listing Plows, 12¢. Some manufacturers of high-grade Tool Steels have recently advanced their prices with good results. They claim their Steel worth what they ask for it, and their bold action appears to have convinced consumers.

**Steel Rails.**—The North Chicago Rolling Mill Company's works at South Chicago started up again last week, having completed necessary repairs. This is the only Rail mill now in operation in this vicinity, but the prospects are encouraging for the starting of another in a month or two, as orders are accumulating to such an extent that this may be obligatory. A number of small orders were booked, but no large orders were positively secured. Prices are unchanged at \$30 @ \$30.50. The rumor that the projected consolidation of Steel companies had fallen through is untrue. No obstacle to the plan has yet developed, and nothing has happened to cause the least apprehension of such an occurrence.

**Track Supplies.**—Small orders only are in the market, but sellers quote as low prices on them and compete as vigorously for them as though they were very large. Steel Fish Plates are quoted at 1.85¢ @ 1.90¢; Iron Fish Plates, 1.65¢ @ 1.70¢; Railway Spikes, \$2 @ \$2.10; Hex. Nuts, 2.70¢.

**Old Rails and Wheels.**—Prices of Old Iron Rails declined last week, with sale at various rates from \$20.25 down to \$19.75. They are probably worth about \$19.50 at present, although the supply is limited. A lot of several hundred tons of Old Car Wheels was sold at \$18, which seems to be the limit of buyers' bids, although most holders still ask \$19.

**Scrap.**—Free sales of No. 1 Mill Iron have been made to consumers at \$13 @ \$13.50 net ton. Small quantities of No. 1 Forge were also sold at \$18.50, which now seems to be the top of the market. Machinery Cast is quoted at \$12.50 @ \$13, and Stove Plate at \$10. Low-priced Scrap

like Borings and Turnings appears to hold up better than the more costly grades. Mixed Steel has been offered at \$11.50. Dealers are buying stock from railroads now at very low prices, but still quote \$13 @ 13.50 for Mixed Country.

**General Hardware.**—Jobbers report a very fair trade in both Shelf and Heavy Hardware. Summer goods are beginning to move off quite actively, and a heavy demand is promised for Screen Doors, Window Screens, &c. Staple articles are freely called for, but prices are cut very close. In most cases the manufacturers are to blame for this state of affairs. They form combinations to maintain prices on certain lines of goods, and then sell other products in connection with them at less than cost, thus neutralizing the effect of the combination and enabling dealers to compete with them in open markets.

**Nails.**—Prices are not any stiffer than they have been, although jobbers appear to be endeavoring to work their trade into more satisfactory shape. The combination on Steel Nails is being adhered to by the manufacturers, so far as controlling production is concerned, but they are getting uneasy over the slow sale of their product and developments may be expected at any time. Jobbers' quotations are still as follows: Small lots of Steel Nails \$2 and carloads \$1.95; small lots of Wire Nails \$2.40 and carloads \$2.35.

**Barb Wire.**—As far as can be ascertained, all the manufacturers at work are now full of orders and behind in their deliveries, so that prices are somewhat firmer. Buyers are no longer able to dictate terms. Jobbers' prices are a little higher, but it is not expected that they will advance much, as all of them had evidently placed heavy orders when manufacturers were selling at very low rates. Small lots are now quoted at 2.80¢ for Painted and 3.40¢ @ 3.45¢ for Galvanized.

**Pig Lead.**—The situation has improved, partly through the disposition of consumers to take hold at present prices and partly through the withdrawal of offerings by holders, who anticipate better prices in the near future. Sales of 800 tons are reported at about 3.47½¢, with 3.50¢ asked at the close and but limited quantities offered for sale.

**Copper.**—Manufactured Copper holds its own 25¢ rates, but consumers are buying very sparingly. Dealers are carrying light stocks in anticipation of lower prices, of which, however, there is no immediate indication in this market.

Thomas M. Jones, of Jones & Loughlins, who died at Pittsburgh on the 12th inst., was formerly manager of their Chicago branch, occupying the position now held by J. M. Larimer. Mr. Jones was highly esteemed by his associates and his Chicago business acquaintances, who heard of his decease with deep regret.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Ave.,  
Pittsburgh, April 16, 1889.

We can chronicle an increasing volume of business in the Iron and Steel trades, but prices do not improve. So many in the business are in urgent need of money that they are obliged to realize on their product at any price, and this accounts in a great measure for the present depression of prices.

The Amalgamated Association of Iron and Steel Workers will ask that all the Iron mills be closed for two months during the summer. This move has been decided upon by a majority of the lodges, and appears to meet with general approbation on the part of Iron workers.

While there is a difference of feeling in regard to the recent attack of Mr. Andrew Carnegie upon the Pennsylvania Railroad, it is generally agreed that the agitation of the matter may be productive of good results. There are a great many people who agree with Mr. Carnegie that this great corporation has not treated Pittsburgh nor the State of Pennsylvania justly nor equitably, and we believe that the discussion of the matter now going on cannot but be productive of good results.

Iron brokers have become very numerous in Pittsburgh within the past few years, and it is complained that the brokerage business is very much overdone. It is said that some of the city furnaces are making it a point to sell direct to consumers, and thereby avoid the brokers as much as possible. However, nearly all the Iron made at other points is being sold through brokers. Among others, the following named parties and firms are engaged here in the brokerage business: Nimick & Co., A. H. Childs, Shearman, Collard & Co., Robinson & Orr, H. E. Collins & Co., J. H. Hillman, H. G. Dravo, W. P. Snyder & Co., T. G. Boyle & Co., F. N. Hoffstott & Co., Preston & Humphreys and J. W. Porter & Son.

**Pig Iron.**—There has been a little more activity during the past week, but with this exception the general situation remains unchanged. Consumers continue to buy as their immediate wants require, and it is evident, therefore, that they are not apprehensive of any immediate advance in price, although furnacemen are not particularly anxious in regard to making additional contracts. Standard brands of Mill Iron may be fairly quoted at \$14.25 @ \$14.50, four months. A broker who had an order to buy a round lot at \$14, cash, after canvassing the field pretty well reports that he was unable to find a seller. We can report a sale of 1000 tons at \$14.25, cash; also 500 tons All-Ore Mill at \$15.50, cash. Foundry Irons continue dull, but prices remain unchanged. Small sales No. 1 at \$16.50 @ \$17, cash, and No. 2 do., at \$15.50 @ \$16. Bessemer Iron is lower, sales of 4000 tons reported at \$16.25, and 1000 tons at \$16.50, both cash. We quote as follows:

Neutral Gray Forge.....	@ \$14.25, cash
All-Ore Mill.....	15.50 @ 16.00, "
White and Mottled.....	13.00 @ 13.50, "
No. 1 Foundry.....	16.50 @ 17.00, "
No. 2 Foundry.....	15.50 @ 16.00, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal.....	24.00 @ 27.00, "
Bessemer Iron.....	16.25 @ 16.50, "

**Manganese.**—Sales of Ferromanganese reported at \$59.50 @ \$60 for 80 %, and Spiegel at \$28.50 @ \$29 for 20 %.

**Muck Bar.**—There is an increased inquiry, but no improvement in prices. We are advised of sales of some 2000 tons at \$26.50 @ \$26.85, cash. Now that there is a considerably increased demand for Skelp Iron there will be a corresponding improvement in the demand for Muck, as some of the mills making a specialty of Skelp buy considerable quantities of Muck.

**Manufactured Iron.**—The demand for Merchant Iron continues low for the season, but it is improving somewhat, and it is thought will continue to improve as the season becomes more advanced. Some of the mills are pretty fully employed on Skelp Iron, which is still quoted at 1.65¢ for Grooved and 1.90¢ for Sheared. Bar Iron is quoted at 1.65¢ @ 1.75¢, 60 days, 2 % off for cash, according to quality. Old Rail Iron can be had below prices quoted.

**Nails.**—There is a slightly improved demand, but it is chiefly of a local character, and consequently for small lots. Card rates are still adhered to—\$1.90, 60 days, 2 % off for cash for 12d to 40d. Private advices from Wheeling continue to report business very dull there.

**Wrought-Iron Pipe.**—This department of the iron trade continues to improve. Not only are the combination prices being faithfully adhered to, but there is continued inquiry and some of the mills have about all they can do. There has been a decided change for the better since the New York meeting, and it looks now as if there would be a good healthy trade from now until next fall, as new gas and oil fields are being opened up, which will require large quantities of pipe. We continue to quote prices as before: Discounts on Black Butt-Welded Pipe 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Boiler Pipes, 62½ % off; Casing, 5¼-inch, 62½ % off; Two-inch Tubing, 18¢ per foot, net; 3-inch Line-Pipe, 20¢; 6-inch do., 53¢; 8-inch, 90¢.

**Old Rails.**—The market continues dull, and prices are weaker. We now quote American Tees at \$22.75 @ \$23, with a sale of 500 tons reported at inside quotations. Old Steel Rails remain as last quoted; sales at \$17.50 for short and \$19 @ \$20 for long lengths. There appears to be more inquiry for Steel than Iron Rails.

**Billets, Blooms, &c.**—Demand continues light, while prices remain unchanged; sales Bessemer Steel Billets reported at \$27 @ \$27.50, cash, at makers' mill; Domestic Bloom and Crop Ends, \$18, cash, at which last sales, reported some weeks ago, were made.

**Steel Rails.**—Heavy Sections are quoted at \$26.50 @ \$27.50, cash, at mill here, according to size of contract, delivery, &c. Carnegie, Phipps & Co. continue to make shipments South and West by river; they have shipped 20,000 tons by river within the past couple of months. The mill of the Allegheny Bessemer Steel Company, at Duquesne, while not so large as some of the others, is claimed to be one of the most complete mills in the country.

**Railway Track Supplies.**—There is more doing, but no change in prices. Spikes, 2¢, 30 days, delivered f.o.b. at works. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square, and 2.85¢ with Hexagon Nuts. It is thought there will be a considerably improved demand within the next few weeks.

**Old Material.**—The demand continues light, but it is thought there will be an improvement within the next week or two. No change in prices. No. 1 Wrought Scrap, \$19 @ \$19.50, gross; Wrought Turnings, \$18; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14 @ \$14.50, gross; Cast Borings, \$11 @ \$12; Old Wheels, nominal at \$19.

## Cleveland.

CLEVELAND, April 15, 1889.

**Iron Ore.**—There is a steady demand from the furnacemen, but sales during the past week have been confined to comparatively small orders. Additional vessel charters from the upper end of Lake Superior at \$1.25 are reported, and the mine owners claim to have engaged tonnage from Escanaba at 90¢ for six or seven trips. Menominee ore, particularly from the Chapin mine, is in demand at \$5.10 @ \$5.20, f.o.b. vessels Lake Erie ports. Both Champion and Republic Bessemer are commanding \$5.75, and Ores from the Minnesota mines are selling quite freely at the same figure. What is termed the local market has not yet assumed an active phase, particular attention now being paid to the work of encouraging the Eastern trade. Dealers anticipate orders from this quarter aggregating 750,000 tons. Scattering sales of non-Bessemer Ores at \$4.10 @ \$4.20 are reported, but a number of

large transactions are looked for within the next week or 10 days. A considerable quantity of new Ore will arrive from Escanaba on Wednesday or Thursday of this week.

**Pig Iron.**—Slight concessions have been made during the past week in order to enliven the market, and in consequence a few sales can be recorded at prices from 25¢ to 50¢ below current quotations. The furnacemen are restricting their output, and basing their hopes on a revival of activity in May. A small lot of good Foundry Iron is said to have sold for \$16.50, but the transaction forms no basis upon which to base quotations, which are entirely contingent upon the circumstances surrounding the different furnaces. Dealers are unable to give reasons for the present dullness, and are inclined to take a hopeful view of the future.

**Old Rails.**—Prices are again declining, and not over \$21 is being paid for Old American Rails. Other kinds of Scrap are correspondingly depressed.

## Cincinnati.

Office of The Iron Age, Fourth and Main Sts. }  
CINCINNATI, April 15, 1889.

**Pig Iron.**—No new features have been developed in the local market for Pig Iron during the week under review. The volume of business has been light; at least individual orders have been small. A weaker tone has prevailed for all kinds and grades and lower prices have been accepted for Foundry make, but Forge Iron has been better sustained. Producers still persist in the view of a more active business and higher prices during the latter half of the year, and make but little effort to sell for present or near-by delivery. Buyers, on the other hand, believe in lower prices before higher are realized, notwithstanding the fact that the furnaces claim prices are already at the cost point and a number blowing out for repairs will not resume until a decided change for the better is indicated. The poverty of the market is well illustrated in the fact that there has not been a 1000-ton order recorded during the week, and even 500-ton sales have been few. Moderate amounts of No. 1 Southern Coke Foundry have been sold at \$14.75, No. 2 ditto at \$14, and there are reports that even these rates have been shaded. Gray Forge has been apparently well sustained at \$13. Car-wheel Irons have remained slow, with stocks at both Northern and Southern stacks accumulating. The following are the approximate prices current here at the close, for cash, f.o.b.:

Foundry.		
Southern Coke, No. 1 (new classification).....	\$14.75 @	\$15.25
Southern Coke, No. 2 (new classification).....	14.00 @	14.50
Southern Coke, No. 3 (new classification).....	13.50 @	14.00
Ohio Soft Stone Coal, No. 1.....	15.50 @	16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @	15.25
Mahoning and Shenango Valley.....	16.50 @	17.00
Hanging Rock Charcoal, No. 1.....	21.00 @	22.00
Hanging Rock Charcoal, No. 2.....	19.00 @	22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @	18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @	18.00
Forge.		
Strong Neutral Coke.....	13.25 @	13.50
Mottled Neutral Coke.....	12.25 @	12.50
Gray Forge.....	13.00 @	.....
Car-Wheel and Malleable Irons.		
Southern Car-Wheel.....	20.00 @	25.00
Hanging Rock, Cold Blast.....	22.00 @	25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @	21.50

**Manufactured Iron.**—The trade for Finished Iron has not improved, and an easy tone has continued without essential change in prices.

**Nails.**—There has been an improved demand and a steady market. 12d @ 40d sell at \$1.95 @ \$2 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$2, and Steel Wire Nails at \$2.55 @ \$2.60 per keg.

**Old Material.**—The demand has been light for Old Rails, and an easy tone has prevailed, but there has been no pressure to sell, and prices are quotable at \$20 @ \$20.50 per ton, cash. There has been very little inquiry for Old Wheels, which are nominal at \$18 @ \$18.50, cash, spot.

## Birmingham.

BIRMINGHAM, ALA., April 18, 1889.

Affairs of the Iron market hereabouts remain practically unchanged. There is but moderate selling, and stocks are accumulating at the furnaces. Hope of better things, coupled with the much improved condition and outlook in monetary circles, braces manufacturers generally. Some, however, still complain of the superior freight-rate advantages given by Northern railways to furnaces in that region. Apropos to this subject, at a dinner given this week to Baron Erlanger, of Paris, France, head of the syndicate controlling the Queen and Crescent Railway system, the matter of freight on Iron products was one of the chief topics of conversation. Mr. Thomas A. Mack, manager of the Eureka Furnace, at Oxmoor, controverted a statement that Birmingham had the best of freight rates. The Southern furnaces were at a disadvantage when it came to a question of rates with the furnaces at the North by at least 25 %, and the railroads here have a great deal to do before they will reach near perfection on that score. Some other expressions, giving instances, added force to the suggestions of Mr. Mack. It is realized that while the South, particularly the Birmingham district, has made wonderful strides in Iron manufacture, the market is not here, but at the North, to the consumption of which that of the South is now as a drop to the bucketful. There is, nevertheless, encouragement for the future in the fact that Birmingham is amply provided with railways, most of them of too recent completion to forecast results, though of palpably sufficient importance to inspire confidence and larger investment.

The directors of the Tennessee Coal, Iron and Railroad Company are to visit the district next week to take a view of their property about here, and it is given out that one of the subjects to which they will devote especial attention will be the making of a test of Steel manufactured by the basic process.

The same forces, which of late years, by means of Iron and land companies, have developed property upon which manufactures most notably of Iron materialized, show signs of renewed buoyancy, which will likely result in something fruitful this spring. Another furnace is promised at Attalla, in Etowah County, on the Alabama Great Southern division of the Queen and Crescent system, and the projectors are assured by the people of that road a branch to the coking coal fields of Murphree's Valley, about 40 miles to the west, a little northeast of Birmingham. This same coal is coked by the Birmingham Furnace and Mfg. Company, who have a plant at Trussville, this county. One of their furnaces went into blast this week. The furnaces are each 125 tons capacity. The managers and principal owners are Connellsville, Pa., men. They say the Coke here averages well up with that of Pennsylvania and is in some respects superior. The developing of Coking Coal, while progressing rapidly, has not been equal to the demand, notably for the furnaces and foundries at Sheffield, Florence, Decatur and Gadsden. Foundries and machine shops at New Orleans, and other places ask for contracts larger than can now possibly be met. The early completion of the Birmingham mineral branch of the Louisville and Nashville

Railroad will greatly aid the removal of this embarrassment of manufacturers about here. All the roads touching Birmingham will pursue the same policy as that of the Louisville and Nashville Railroad in reaching out after all mineral properties upon which practical development is taking place. This building of many small new lines has already been of great benefit to Birmingham, and it is confidently believed the near future holds out still greater rewards for labor and capital.

## St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,  
St. Louis, April 15, 1889.

**Pig Iron.**—Extreme quietness prevails. Some few transactions for small lots are being entered from day to day, but even these are fewer than for some weeks past; prices are correspondingly weak. Any prediction as to the future course of the market seems useless, and the general feeling is to accept the situation and await developments. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	\$15.50 @ \$16.00
Southern Coke, No. 2 Foundry,	15.00 @ 15.25
Southern Coke, No. 3 Foundry,	14.50 @ 14.75
Gray Forge.....	13.50 @ 14.00
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	20.50 @ 21.50

### Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

### Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.

**Bar Iron.**—The market shows signs of activity and some fair-sized orders have been booked during the past week. Indications point to a continued improvement, as mills are all busily engaged and have some good-sized orders in view. Prices are a little firmer, but no advance can be noted as yet. For small lots from store we quote 1.80¢, and carload lots 1.60¢ @ 1.70¢, according to circumstances.

**Barb Wire.**—There is a general improvement in the volume of business, and prices are firmer than they have been for some time. The severe competition and low prices which have characterized this department seems to have been withdrawn. Mills that make a specialty of Plain Wire are running full time, and the difference in price between Smooth Wires and Barbed Wires seems wholly inconsistent, as Plain Wire is held at such figures that it is almost impossible apparently for Barb Wire manufacturers to produce stock at any profit, if they pay the prices quoted for Plain Wire. Mills are quoting from \$2.80 to \$2.85 for Painted, and from \$3.40 to \$3.45 for Galvanized. Carload lots are quoted at from \$2.70 to \$2.75 for Painted, and \$3.30 @ \$3.35 for Galvanized, f.o.b. St. Louis.

## Detroit.

WILLIAM F. JARVIS & Co., under date of April 15, 1889, report as follows: Since our last report there has been but little change in the situation here. The market is quite active and the volume of business is above the average for this season of the year. Several large sales of Lake Superior charcoal have been made and in most cases prices have been sustained. Should the demand continue as active for any length of time as it is at present, prices will undoubtedly be advanced. Numerous small orders for Coke Iron have been received and stocks in the hands of small users are very light. In several instances sellers have refused offers a little under figures asked, and it looks as if prices

were likely to range higher instead of lower. We quote for the present as follows:

Lake Superior Charcoal, all num-	\$19.50 @ \$20.00
bers.....	
Lake Superior Coke, all ore.....	18.50 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.50 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

## Louisville.

LOUISVILLE, KY., April 16, 1889.

**Pig Iron.**—The market is in a peculiar condition, and it is thought a decided change, either for the better or worse, must take place soon. At present prices furnaces cannot continue to make Iron, and claim that unless a change takes place it will be wise for them to blow out. The sales during the past week show no improvement, and some offerings show a tendency to further decline. Furnaces generally seem willing to make sales for long delivery to customers of undoubted credit. There has not been very much Iron placed during the past week, buyers having bought all they desire. We quote as follows:

Southern Coke, No. 1 Foundry,	\$14.75 @ \$15.25
new classification.....	
Southern Coke, No. 2 Foundry,	14.25 @ 14.75
new classification.....	
Southern Coke, No. 3 Foundry,	13.75 @ 14.25
new classification.....	
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry	16.25 @ 16.75
" No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard	21.75 @ 22.75
brands.....	
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

Macfarlane & Murdue, Kenyon Building, Louisville, Ky., dealers in Iron, Coal and Coke, announce that they have succeeded to the business of Kent, Macfarlane & Murdue, from which firm C. J. Kent had withdrawn.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street,  
New York, April 17, 1889.

**American Pig.**—Reports from the West are by no means encouraging, the Cincinnati market again showing a declining tendency, with \$14.75 named for No. 1 Southern Foundry. Since the difference between cost of delivery in Cincinnati and in this market is about \$1 ¢ ton, it is evident that there is considerable margin below the parity in prices quoted here. Southern No. 1 has been offering here at \$16.75 @ \$17, without, however, so far as we can learn, securing much business. Reports are again coming to hand that founders are rejecting Southern Irons, which in some instances may be due to the fact that sales agents in their eagerness to do business have adopted the practice of shipping No. 2 instead of No. 1. There are rumors that some of the Lehigh companies are accumulating Iron, and that deliveries on contracts are being delayed. We are informed, however, by the leading company that current shipments are satisfactory. We continue to quote: Northern standard brands, tidewater delivery, \$17.50 @ \$18 for No. 1; \$16.25 @ \$17 for No. 2 Foundry, and \$15 @ \$15.25 for Gray Forge.

**Ferromanganese.**—Importers' quotations vary widely, the difference between the lowest and highest bids for a contract for a few hundred tons having been \$3 ¢ ton. We quote \$56.50 @ \$57 as a close price for 80 ¢ Ferromanganese.

**Wire Rods.**—The market is dull at \$41.25 @ \$41.50 for Foreign.

**Old Rails.**—The only transaction reported is a lot of 500 tons of Double Heads at private terms. The market is weaker, but irregular, with little offering here, and little demand. At other points lower figures are being made, however. Thus, a lot of 500 tons of Tees is being offered at \$21.25 at Buffalo, which is equivalent to about \$22.50 here.

**Track Material.**—Spikes remain dull at \$1.95 @ \$2 ¢ keg delivered, with Angles Bars selling at \$1.75 @ \$1.80 delivered for sound lots.

**Structural Iron and Steel.**—We quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.35¢ @ 2.5¢; Flange, 2.6¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

**Bar Iron.**—We quote: Carload lots on dock, half extras, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Steel Rails.**—Only a moderate amount of business has been done, small sales having been made to Eastern roads aggregating about 1000 tons, while the Manhattan Elevated Road opened bids for 1500 tons to-day. There are a number of bona fide inquiries in the market, aggregating about 20,000 tons, the bulk of them for Southern delivery. We continue to quote \$27 @ \$27.50 for large lots at Eastern mill. The April report of the Board of Control shows aggregate sales of 670,160 tons out of a total allotment of 990,850 tons. Last year up to the same time the sales were 658,513 tons, and in the year 1887 1,494,384 tons. The shipments for the first quarter in 1889 were 244,765 tons, against 184,580 tons in 1888 and 389,532 tons in 1887.

The Moorhead-McCleane Company, W. P. Loughry, agent, 81 John street, have sent out a stock list of Soho C.H.B. Galvanized Sheet Iron, under date of April 13. The exact quantities of Sheets on hand of the different sizes and gauges are given in detail.

## Financial.

Business advices are decidedly more cheerful, perhaps in sympathy with the revival taking place in the world of nature. Agricultural operations appropriate to spring are in full activity through the Northwest, where a large area of wheat lands have been seeded, and prospects for the next harvest are auspicious. The statistics for foreign traffic are also favorable, chiefly on account of the remarkably large exports of cotton, the wheat movement being still on a restricted scale. Wheat prices dropped again about 2¢ ¢ bushel. Corn was lower and pork products had a lower tendency. Sugar advanced ¼¢ on raw and refined, under speculative management. The exhibit of railroad earnings was not particularly flattering, if comparison is made between the last few weeks, meteorologically considered and the embarrassments that hampered transportation a year ago—blizzards and strikes. General trade in this city is dull.

The Stock Exchange market was influenced exclusively by professional managers in the absence of legitimate traders. A further marked decline in Atchison occurred, affecting the investment market as well as the more general list, but Reading, St. Paul and others among the most active stocks advanced, declining, however, at the close. Various movements in the sugar trust were reported and refineries advanced about 15 ¢, to drop off again



on Wednesday to 93½. The railroad bond was particularly active.

New York Sub-Treasury operations for the week included the payment of \$5,045,935 for purchased bonds, by which the associated banks gained \$5,004,616. The statement for the week reports an increase of \$5,481,700 cash. As the disbursements by the Treasury counted in the statement of averages for little more than \$2,000,000, the return movement from the interior must have been much larger. The statement was made up, moreover, on rising averages and the actual condition of the banks is much better than it shows. The contraction of loans was regarded as a healthful sign. The changes resulted in a gain of \$4,655,975 to the surplus reserve, which is now \$6,065,550, against \$10,870,425 a year ago, and \$4,488,650 in the same week in 1887.

Money during the week has got into a better shape, funds being in good supply, principally in consequence of disbursements from the Treasury in the purchase of bonds, amounting to nearly \$10,000,000. The threatened export of specie was averted by easy money in London. Rates for time loans are not materially changed, but were to some extent nominal. A return movement from the interior is not improbable, the recent heavy demand from Southern points having wholly ceased. Sterling exchange continues high, and exports of gold in any amount are not apprehended.

The foreign commerce of New York for the month of March and for the last three months makes a favorable showing compared with last year, but the imports of late indicate no "boom," which many expected would follow the settlement of the Presidential contest. While the total imports for the month amounted to \$40,622,000, against \$40,875,000 last year, the specie item fell off nearly \$2,000,000. The total imports for nine months, exclusive of specie, were \$347,838,815, the largest in the history of the trade with three exceptions. The exports for the month, exclusive of specie, were \$28,859,335, against \$22,843,204 last year and \$28,365,160 in 1887. The increase over last March, \$6,016,131, is covered by the increased exports of domestic produce.

Representatives of the silver mining interests on the Pacific Coast are believed to have had an interview with Secretary Windom much less satisfactory than they had hoped for. Senator Stewart, of Nevada, would have the present output of silver coin increased to \$4,000,000 a month, as a way of reducing the Treasury surplus, but the Secretary was unable to see how a mere conversion of gold, greenbacks, &c., into silver would effect this result. It would rather aggravate the evil complained of. More likely the Treasury policy of the last three Administrations would be adhered to for the present; at least until President Harrison's views are better known.

## Metal Market.

**Copper.**—London declined for the week from £39. 15/ spot, to £37. 5/ and futures from £39. 10/ to £37. 10/, sales summing up the large amount of 2675 tons. In their monthly report of April 1 Messrs. James Lewis & Son, Liverpool, expressed themselves as follows: "So far as the mining companies are concerned, they have been able to pay their shareholders very large dividends for 12 months, which will be some set-off to the greatly reduced dividends they are now earning. That it is the interest of these companies to agree to reduce their production until it has been overtaken by consumption is clear. The difference between the price obtained by the three Spanish companies, under their contract with the *Société des Métaux*, of

£70 per ton for Best Selected, and the present value of £45 per ton, represents upon their last year's production of about 50,000 tons a difference of £1,250,000. A reduced production and higher price would considerably diminish this loss; whereas, if production is not decreased by these and other large companies Copper will probably fall to £35 per ton for Best Selected, representing to them a further loss of £500,000. Representatives of 90% of the American production are now in Paris, and it is possible that advantage may be taken of this to endeavor to arrange some means for supporting the market and gradually realizing the large quantities of Copper in the hands of French and other banks and banking firms without ruinously sacrificing them. To accomplish this end it will be necessary that the present holders of the large stocks of Copper here, in France and in the United States should work in unison with the larger producers." The ensuing cablegram was received from London April 13: "The liquidator of the Comptoir d'Escompte, of Paris, will arrive in this city on April 15 for the purpose of opening negotiations whose object is to obtain the canceling of contracts between the Comptoir d'Escompte and the English copper mining companies." Nothing has transpired since with reference to the result of negotiations on the other side on the part of the American mining companies. A cablegram this morning states that prospects in this respect remain cloudy. On the 15th inst. the visible supply of Copper in England and France had reached the unprecedented aggregate of 126,720 tons. During the first quarter Liverpool and Swansea imported 8610 tons of American Copper, against 6789 in 1888. It is stated that the Lake companies are delivering to consumers on this side whatever Copper they may want for their current requirements with the understanding that the price is to be that of the next pool sale. At Philadelphia casting brands changed hands at 12½¢ in the meantime. The following was received from Boston: "April 13, 1889.—The directors of the Boston and Montana Mining Company to-day declared a dividend of \$1 per share to stockholders of record April 29. They also direct that a special meeting of the stockholders should be called, notice of time and place of which will be duly given later, to authorize the issuing of a general mortgage of \$500,000, to provide the means for the company to build itself an adequate smelting plant, which they not only recommend but deem absolutely necessary. They think that the proceeds of these bonds and the profits of the mine will pay for the completion of the new smelting plant and enable the company to pay dividends of at least \$4 per share per annum. The saving made in the cost of Copper by the erection of the smelting plant, it is estimated, will pay the cost of the entire works in less than two years. Mr. Jere Abbott resigned and Mr. A. W. Spencer was chosen a director in his place." "April 16.—There are some hints of inside support of Boston and Montana, which holds at 31½, but it is realized that on a dividend basis of \$4 per year it will return 12½% to the purchaser at present prices. Hence it is likely to hold above 30, unless further bad news is received about the Copper situation. It looks now like a 10¢ per ton market again."

**Tin.**—There was a decline in the London market during the week from £92. 12/8, spot, to £91. 15/ yesterday, and in futures from £93. 10/ to £92. 15/, sales aggregating 860 tons. Here there were sold 10 tons May, 20 tons June and 10 tons July at 20.70¢; 75 tons July at 20.85¢, and 25 tons August and 25 September at 20.90¢, subsequently 20 tons spot and 20 tons May at 20.67½¢; 10 tons July at

20.65¢ and 15 September at 20.75¢. Messrs. Gilfillan, Wood & Co., Singapore, write, under date March 12: "This month's export of Tin will be moderate, and it is expected that the arrivals for some time will be on a more moderate scale than they have been of late." During the first two months the Straits Settlements exported to the United States 22,230 piculs Tin, against 1888, 9846; 1887, 12,866; 1886, 14,715; 1885, 4205; and 1884, 9841. Spot Tin closes at 20½¢ @ 21¢. **Tin Plates.**—A resumption of activity has been checked by the stiff attitude of importers and the continued high prices demanded by most makers. At the late Birmingham meeting the makers talked as though they all felt very strong, but since then several of them have modified their views and begun to name special prices in order to induce fresh orders. We quote, large lines, ordinary brands, per box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.75; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.30 @ \$4.40, and Wasters \$4.15 @ \$4.20.

**Lead.**—Toward the close of last week some 400 tons Common Domestic were sold at 3.70¢ for June, most of it, some being May delivery at 3.72½. As refiners wished to check the advancing tendency they put 50 tons on the market and sold them at 3.65¢, but it was of no avail, the market rallying since to 3.70¢ asked and 3.67½¢ bid, at which it closes strong. The Western markets are firm at 3.40¢ @ 3.45¢.

**Spelter.**—Has remained featureless at 4.65¢ @ 4.70¢ for Common Domestic, with only a small business transacting, while Silesian continues to be held nominally at 5.50. @ 5.62½.

**Antimony.**—A good consumptive demand has been noticeable at 12¢ @ 12½¢ Hallett's and 13½¢ Cookson's.

## New York Metal Exchange.

The following sales are reported:

THURSDAY, April 11.

200 tons Lead, May..... 3.97½¢

FRIDAY, April 12.

16 tons Lead, May..... 3.70¢  
25 tons Tin, July..... 20.85¢  
25 tons Tin, July..... 20.90¢  
25 tons Tin, August..... 20.90¢  
25 tons Tin, September..... 20.90¢  
25 tons Tin, July..... 20.80¢  
10 tons Tin, May..... 20.70¢  
20 tons Tin, June..... 20.70¢  
10 tons Tin, July..... 20.70¢

SATURDAY, April 13.

10 tons Tin, spot..... 20.70¢  
10 tons Tin, May..... 20.65¢  
10 tons Tin, spot..... 20.65¢

MONDAY, April 15.

10 tons Tin, May..... 20.70¢  
15 tons Tin, September..... 20.75¢

TUESDAY, April 16.

10 tons Tin, July..... 20.65¢

WEDNESDAY, April 17.

10 tons Tin, September..... 20.75¢  
38 tons Lead, June..... 3.70¢

A special to the Metal Exchange, from London announces that L. Lazarus & Son have bought nearly 1000 tons of Copper this morning, but the market is generally selling. Prospects for a combination of the mining companies are very cloudy, and a new pool very doubtful. No positive information obtainable as yet regarding result of negotiations.

## Coal Market.

The Anthracite Coal market continues to be dull and weak. Although this is usually the unfavorable season, it has proved to be more so this year than ever before, for reasons to which we have already alluded. The inquiries are chiefly for the smaller steam sizes, and it is therefore only Pea and Buckwheat Coal which are in good demand. The new rates of toll went into effect on the 15th. Prices may be quoted as follows, the lower figures

being made by individual operators: Broken, \$3.50 @ \$4; Egg, \$3.75 @ \$4; Stove and Chestnut, \$3.75 @ \$4; Pea, \$2.50 @ \$3. The Chicago Bureau of Anthracite Coal statistics reports the receipts for the first quarter 45,381 tons, and the stock on hand 461,359 tons, a total of 506,740 tons, as compared with 332,416 tons in 1888, an increase of 184,324. For the week ending April 7 the output was 503,582 tons. The Reading Company have suspended operations two days last week, and will stop the two last days of this week and Monday of next week. This, it is hoped, will somewhat aid the market.

The Bituminous Coal trade is quiet, although relatively in a better condition than the Anthracite market. Prices are quoted: \$2.25 @ \$2.40, f.o.b., Baltimore, and \$3.25 @ \$3.50, alongside, New York. Some contracts have been placed in the New England market.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 17, 1889.

Copper has been active during the week. Large buying orders for Merchant Bars were received and executed prior to Friday, and for a time the market looked like recovering. Subsequently a heavy quantity was pressed for sale, and weakened the market greatly, resulting finally in sales at £37, cash, or 40/ decline from the highest point of the week. The fact has been disclosed that the Spanish Mining Company have delivered to the Société des Métaux three times the quantity of Copper stipulated for in the original contract. It is also said that the Mason & Barry Company will soon begin legal proceedings against the Société. Matters are in so complicated a condition that there seems now to be very little chance of producers and holders coming to an agreement. Consumers are now buying below the level intended by the negotiator, and manifest no inclination to deviate from their present course. It is announced that the quantity of Copper under the control of the Comptoir d'Escompte was 170,000 tons, distributed among 11 banks, two of which have realized. The mines of the Caradon Company have been closed, and will remain so until the market is in better shape. Best Selected Copper is scarce, except at comparatively high prices, as the companies are not free to sell. The price is now, nominally, £45, against £37 for Merchant Copper.

Tin Plate makers booked heavily at the quarterly meeting, and are very firm on prices, despite the present heavy production and accumulation of stocks at the shipping ports. The total stock is now about 351,000 boxes, against 248,000 boxes the corresponding period last year. The project of the formation of a syndicate to regulate prices and production has been revived. The proposition provides for curtailing the make and advancing prices about 1/ per box.

Pig Iron warrants have declined sharply, Scotch selling to 43/11, Middlesboro' to 38/6, and Hematites to 49/, under the effect of pressure from the "bears." Outsiders have been operating freely, and their purchases give the market some support. In makers' brands trade has been quite brisk, but the course of warrants has somewhat

adversely affected prices. Manufactured Iron continues active, and prices are very firm.

Foundry Pig has advanced to 57 marks in the German market.

There is more old material offering in this market, and prices are somewhat irregular, and rather too high for business on a liberal scale.

In the Steel department there is considerable activity, more particularly in Rails and Billets, prices for which continue strong.

Scotch Pig.—Business fairly active, but prices a shade lower on most brands.

No. 1 Costness, f.o.b. Glasgow	56/
No. 1 Summerlee, " "	56/3
No. 1 Gartsherrie, " "	58/
No. 1 Langloan, " "	55/3
No. 1 Carnbroe, " "	48/
No. 1 Shotts, " at Leith	58/
No. 1 Glengarnock, " Ardrossan	52/
No. 1 Dalmeilington, " "	46/6
No. 1 Eglinton, " "	45/

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

Cleveland Pig.—Less doing in this line and the market not so firm. No. 3 Middlesborough, G.M.B., 38/6 @ 39/ prompt.

Bessemer Pig.—There has been a large business at somewhat lower prices. West Coast brands, mixed numbers, 49/ @ 49/6, f.o.b. shipping point.

Spiegeleisen.—A fairly good demand and prices firmly held. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—The demand continues quite active and makers' prices firm. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

Steel Blooms.—A quite good trade in these at firm prices. We quote £3. 19/3 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Higher prices are quoted and the market continues active. Bessemer, 2½ x 2½ inch, £4. 7/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—The demand moderate and prices held firmly. Bessemer, £3. 19/6, f.o.b. at N. W. England shipping point.

Old Rails.—Business slow and buyers and sellers apart on prices. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

Scrap Iron.—No improvement in the demand. Prices barely steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Sales moderate and at unchanged prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin Plate.—Business has been fairly active at generally firm prices. We quote, f.o.b. Liverpool:

1C Charcoal, Allaway grade	15/3 @ 15/9
1C Bessemer Steel, Coke finish	13/6 @ 14/
1C Siemens " "	14/ @ 14/6
1C Coke, B. V. grade	13/ @ 13/3
Charcoal Terne, Dean grade	12/6 @ 13/

Manufactured Iron.—There is still a brisk business in this department and prices are very firm. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d.	£ s. d.
" Common	"	@ 8 2 6
Staff. Bl'k Sheet, singles	7 12 6	@ 5 17 6
Welsh Bars (f.o.b. Wales)	5 2 6	@ 5 5 0

Copper.—The market quieter at the close and weak. To-day's prices were: Bars, £37 for spot; £37 @ £37. 5/ for three months' futures. Best Selected, £45.

Tin.—A fairly active business at the decline, closing firmer. Straits sold at £91. 10/, spot, and £92. 5/ for three months' futures, reacting 10/ @ 15/.

Lead.—The demand fair and prices very steady. Quoted at £12. 12/6 @ £12. 15/ for Soft Spanish.

Spelter.—More activity in this metal and prices firmer. Quoted at £17. 10/ for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Vireis (Portugal)	51.06
Vireis (Brasil)	54.6
Mark (Germany)	22.5
Kilogram	Pounds
Picul	3.206
	134

### WEST INDIES.

PORT OF SPAIN, TRINIDAD, March 15, 1889.—**Asphaltum.**—There has been increased activity in purchases for export at \$14.04 per ton Boiled, inclusive of export duty, free on board, and \$6.84 Crude. Shipments since January 1 sum up 12,432 tons, against 10,568 and 3523 respectively same time in 1888 and 1887. **Exchange.**—Ninety days' sight on London \$4.74 @ \$4.80.—E. P. Masson.

### CHILI.

VALPARAISO, February 15, 1889.—**Copper.**—In view of the drooping tendency in London sales have been restricted to 19,713 quintals at \$23, which at 29½d exchange equals cost and freight £68. 18/4 in England. **Coal.**—Shipments from England are decreasing, and Newcastle now commands 37/ on the spot and 40/ afloat, while Australian may be had at 25/ @ 27/6. **Exchange** closes at 29½d for 90 days' sight drafts.—Weber & Co.

### EAST INDIES.

MANILA, April 8, 1889.—**Hemp.**—There are buyers at \$14 per picul, against \$8.12½ same date last year, equalling per ton cost and freight £48, against £29. 5/; clearances for the United States since last cable have amounted to 15,000 bales, against none last year; since January 1 there were 105,000 bales, against 43,000; loading for ditto, none, against 20,000; cleared for England since January 1, 79,000, against 104,000; loading for ditto, 9000, against 4000; cleared for all other ports, 10,000, against 20,000. Receipts at all ports since last cable, 11,000, against 5000; ditto since January 1, 186,000 bales, against 157,000 in 1888 and 123,000 in 1887. **Freight,** \$7.50, against \$5. **Exchange,** six months' sight, 3/7, against 3/8½.—Ker & Co., per cable direct to their agent, Mr. Charles Nordhaus, 89 Water street, New York.

### SOUTH AFRICA.

PETRORIA, Transvaal, March 1, 1889.—**Gold.**—It is difficult to ascertain even approximately the actual gold production in South Africa, as so much of it leaves the country in the hands of private persons. The only positive figures are furnished by the official returns of exports at Natal and ports of the Cape Colony. These have been as follows:

1870 to 1880	£324,666
1881	£17,952
1882	22,040
1883	30,457
1884	39,005
1885	£69,543
1886	134,709
1887	235,937
1888	880,464
Total	£109,454
Total	£1,320,653

The increase during the past four years has, according to these figures, been more than twelvefold, the Transvaal furnishing the bulk, and the outlook being more promising than ever this year.—Argus.

### SWEDEN.

STOCKHOLM, April 4, 1889.—**Iron Ore.**—Ore shipments have had to be suspended till now, as the Gellivara-Otten Railway was not in running order, owing to the snow blockades, but four trains of Ore now arrive at Lulea daily, where 40,000 tons are awaiting steamers to load the same. As soon as navigation opens, great activity will prevail.—*Dayblad.*

### SPAIN.

BILBOA, March 30, 1889.—**Iron Ore.**—Orders continue flocking in from all the chief Iron manufacturing regions in Western Europe, and the activity on the spot and "to arrive" causes

great stiffness in the value of Ores, which tend upward. There has been no difficulty in obtaining 8/4 @ 8/8 for Rubios, and 7/2 @ 7/5 for Campinil; the former is, moreover, scarce, and will be more so after a while. The output is under control of but a few mining concerns. Shipments since January 1 amount to 1,009,592 tons, against 990,386 same time last year. Pig Iron is dull, and only 1050 tons went coastwise during the week.—*Bilboa Marítimo y Comercial*.

## HOLLAND.

ROTTERDAM, April 4, 1889.—*Tin*.—Since the beginning of the month there has been an improved tendency, 57.12½ guilders @ 100 kg. now being offered for both Banca and Billiton on the spot. Following are the March statistics in Holland:

Banca.	1889. Slabs.	1888. Slabs.	1887. Slabs.
April 1. Company's stock on warrants at Amsterdam.....	19,361	19,413	14,828
April 1. Company's stock on warrants at Rotterdam.....	22,298	24,042	14,740
Totals.....	41,659	43,455	29,568
Billiton stock in Holland.....	22,483	30,008	23,070
Totals.....	64,142	73,463	52,638
March deliveries of Banca.....	11,550	11,400	9,826
March deliveries of Billiton.....	5,705	1,913	8,992
Total deliveries.....	17,255	13,313	18,818
Banca afloat.....	7,200	12,800	11,200
Stock in Company's hands awaiting coming auctions.....	137,285	90,436	52,227
Billiton afloat.....	39,260	34,950	24,300
Price of Banca, fl.....	56¾	98	61¾
Price of Billiton, fl.....	56¾	101¼	61¾

—Koch &amp; Vlierboom.

## BELGIUM.

BRUSSELS, April 6, 1889.—*Iron*.—The Belgian iron markets remain firm throughout; Foundry Pig continues tending upward. We quote to-day in francs @ 100 kg.: Luxembourg Foundry, 5.10 @ 5.20; Charleroi do., 6.50; do., Forge 4.80 @ 5.80; Luxembourg do., 4.80 @ 4.90. Beams were partially affected by French competition, but have righted again under a brisk export demand, and all makers are busy. Plates and Sheets are scarce; the advance obtained is therefore justified. All Structural works are fully booked. The demand for building purposes is brisk. Railroad Material is also moving off satisfactorily. The proposed removal of the import duty on Pig Iron will benefit the Longwy French blast furnaces more than any other. Luxembourg Foundry Pig will also derive advantages from it. We quote Merchant @ 100 kg.: Nos. 1 to 3, 12.50 @ 14.50; do. at Antwerp, 12 @ 13.50; Beams, 11.75 @ 12; Angles, 13 @ 14.25, and Sheets, 16 @ 25.—*Moniteur des Intérêts Matériels*.

Reports indicate that the Amalgamated Association of Iron Workers propose to ask that the iron mills be closed down for two months during the summer, just as the glass factories.

It is reported that the Heckschers, who are interested in the Bethlehem Zinc Works, have acquired by purchase a zinc works at Japlin, Mo.

Bolckow, Vaughn & Co., of Middlesborough, have introduced in their mills a simple device for increasing the life of rolls. Breaks of large rolls are apt to occur after the mill has been idle for some time, notably on Mondays, because the passage of hot metal through the cold rolls causes strains which lead to fracture. Bolckow, Vaughn & Co. have aimed to avoid this by slowly and uniformly heating the rolls before beginning work. This is done by a series of gas jets arranged on both sides of the rolls level with the necks. The gas pipe is attached to the journal so that it can move up and down with it. After lighting the gas jets the rolls are slowly turned, thus heating them uni-

formly. It is reported that in one English mill the life of rolls increased from 79 days to 342 days, and in another mill a set of 36-inch rolls seven feet long, which had been used for 342 days, broke as soon as previous heating was suspended.

## The Phonopore.

Some two years since the London *Times* called attention to an important advance made in electric science by C. Langdon-Davies. This referred to the invention of the phonopore, an instrument by means of which electrical effects are produced under conditions which had previously been thought to make them impossible. At that time were recorded the results of a demonstration of the practical working of the system in connection with the telegraph line between London Bridge and Folkstone. Since then improvements have been made and the system perfected. For some months past a practical test has been made upon a telegraph line on the Midland Railway.

In order to render a description of the experiments and their results clear, says the *Times*, it will be necessary at the outset to describe briefly the nature of the invention. And here we must first refer to the well-known fact that, if a telephone be inserted in a wire situated near to a line of telegraph wires, every passing current will produce noises in the telephone, notwithstanding that the telephone wire be perfectly insulated from the telegraph wires. These noises are known as induction noises, and it was while investigating the phenomena of induction with the view of devising means to obviate its effects in telephones that Mr. Langdon-Davies made the discovery which has led to the important results under consideration. His investigations led him to the conclusion that induction was caused by some form of electrical force, which might be separated from currents, and which would pass freely through insulations impassible by currents. He further concluded that if this were so a new series of instruments might be constructed for the utilization of this force, and capable of being put in operation in company with current instruments on the same wire. His conclusions have been proved to be perfectly correct by what has since resulted from the development of the principle. Instruments have been made which represent a system of communication of the highest practical utility, and by means of which Mr. Langdon-Davies has added a distinct and independent chapter to the history of electrical development. The only form of electrical force which finds free passage through these instruments appears to be always capable of being associated with sound. The inventor has therefore denominated the force "phonoporic impulse," and the instrument the "phonopore."

It is certainly very remarkable, and to some it may appear almost incredible, that phonoporic messages can be transmitted and received through an ordinary line wire by the phonopore, while at the same time telegraphic messages are being transmitted and received through the same wire by the ordinary telegraphic apparatus. No less remarkable is it, but it is no less a fact, that the phonoporic instruments have no conducting circuit through them. The phonopore gives uninterrupted passage to electrical effects capable of being associated with sound, although it does not permit the passage of electric currents. Externally the phonoporic transmitter resembles an ordinary Morse key, mounted on a base about 4 inches high, containing an instrument somewhat similar to an induction coil. The impulses are generated in a specially-constructed primary circuit, over which is

wound, in place of a secondary circuit, a phonopore, consisting of two wires insulated from each other throughout their whole length and at both ends. Each of these wires, however, is connected at one end to the line. The number of phonoporic impulses generated per second in the transmitter is regulated by the vibrations of an organ reed placed in the primary circuit. Another reed tuned to the same rate of vibration is placed as a receiver at the distant station in front of an electromagnet, and the phonoporic impulses from the transmitter cause it to vibrate. A special form of contact-breaker, operated by the receiver reed, completes a local relay when the reed is still, but breaks it whenever the reed vibrates at its proper rate, thereby setting in action any required instrument in connection with any battery. Divested of its technical surroundings, the phonopore presents itself as a small and simple apparatus, consisting only of a pair of insulated copper wires.

We now turn to its practical application, and to make this clear we will suppose that an ordinary telegraph line from one town to another is provided at each end with the usual telegraph instruments, and that, owing to increase of business, it becomes necessary to provide some additional means of communication. All that is now necessary is to attach to the line at each end a phonopore, without in any way altering the existing instruments, batteries or line. The phonopore can be worked at the same time as the ordinary telegraph instruments, and one is thus made to do the work of two. If the line is already duplexed by ordinary duplex telegraph instruments, the addition of the phonopore will quadruple it. If the line is—as a few trunk lines are—quadruplexed, the phonoporic instruments will "sextuplex" or "octuplex" it. Indeed, it would seem difficult at present to assign any limit to the multiplex carrying capacity of the new system. Upon the artificial line which Mr. Langdon-Davies has set up in his laboratory messages were transmitted at the recent demonstration, first, by the ordinary telegraph instruments alone, and, secondly, by a phonoporic instrument alone. In the next place the ordinary telegraph instrument and the phonopore were worked together in opposite directions duplex, after which the ordinary instruments and the phonopore were worked together in the same direction duplex. The final experiment consisted in the ordinary telegraph and both the phonopore telegraphs being worked together simultaneously through the single line. The three messages were perfectly transmitted, although some of the operators had not previously used the phonoporic instruments. These experiments proved not only the complete possibility of simultaneous working, but that the phonopore can be arranged to work ordinary telegraph instruments, and that when used in duplex or quadruplex work it requires no special regulating or balancing. They also proved that any wire already provided with an ordinary service can instantly be duplexed by merely attaching the phonopore instruments. On a second artificial line there were installed two harmonic phonopore sounder telegraphs, constituting a duplex service without any arrangement whatever to balance the lines, and working through a resistance equivalent to that of about 6000 miles of telegraph wire. Messages were perfectly transmitted through this line in both directions at the same time.

The coal rates within the 40-mile radius from Pittsburgh to Mahoning and Shengango Valley points have been fixed at 60 cents, a reduction of 10 cents from the old rate. The new rates went into effect on Monday, the 15th inst.

# Hardware.

There is a moderate movement in trade in this market, and while in some jobbing centers a good business is reported, there is general complaint on the part of manufacturers and merchants that trade is not up to anticipations. Purchasers are confining their orders to near requirements, and have a good deal of distrust as to the course of the market, recognizing its lack of strength, and notwithstanding that prices are admitted to be very low, apprehending a further shrinkage. There are, however, few changes to note. Most lines of staple seasonable specialties are in good demand. Collections are rather slow.

## Cut Nails.

The volume of business is increasing and the market is steadier, so that the reports of shading \$1.80 on dock for car-load lots for standard Iron Nails are growing less frequent. The agreement of the Eastern Nail manufacturers is still going the rounds. While the movement is regarded as affording much promise by the great majority of the mills, it is only fair to state that a few are not very sanguine as to the outcome, and some question the wisdom of giving a new lease of life to weaker concerns.

James M. Swank, General Manager of the American Iron and Steel Association, has just published the following statistics of the

### PRODUCTION OF IRON AND STEEL CUT NAILS:

Our statistics of the production of Iron and Steel Cut Nails and Cut Spikes in the United States do not embrace Railroad and other Spikes made from Bar Iron, Wire Nails of any size, or machine-made Horse shoe Nails. For the sake of brevity we shall make no further reference to Cut Spikes, treating them as Nails.

Our total production of Cut Nails in 1888 was 6,493,591 kegs of 100 pounds each, against 6,908,870 kegs in 1887, 8,160,973 kegs in 1886, 6,696,815 kegs in 1885 and 7,581,379 kegs in 1884. The production of 1888 was the largest the country has ever attained. The decrease in the production of Cut Nails in the last two years has been mainly due to the increased competition of Wire Nails. In 1886 the production of Wire Nails was about 600,000 kegs, made by 27 Wire-Nail works; in 1887 the production was estimated to have been 1,250,000 kegs, made by 47 works; and in 1888 the production is estimated to have been 1,500,000 kegs, or 150 per cent. more than in 1886. The smaller sizes of Wire Nails are those which have heretofore chiefly competed with Cut Nails, but all sizes Wire Nails are now in general use.

Twelve States made Cut Nails in 1888:

States.	1888—Kegs of 100 pounds.			Total 1887. Kegs.	Total 1888. Kegs.
	Iron.	Steel.	Total.		
Penn.	1,061,938	1,021,031	2,072,969	2,238,165	2,569,237
Ohio.	128,101	1,369,850	1,522,951	1,672,128	1,703,790
W. Va.	213	1,144,968	1,145,151	827,325	869,600
Ind.	97,476	77,521	175,397	369,040	389,922
N. J.	270,912	4,679	275,591	346,117	345,168
Ill.	241,981	241,981	275,072	614,055	614,055
Mass.	176,179	104,122	280,301	267,453	516,749
Cal.	215,000	25,000	240,000	158,193	224,163
Va.	185,844	59,911	245,755	250,519	212,552
Ky.	206,783	206,783	159,720	144,000	144,000
Wis.	41,715	.....	41,715	78,940	206,480
Ala.	.....	.....	.....	54,000	206,500
Col.	7,729	37,368	44,997	45,725	52,383
Tenn.	.....	.....	.....	36,473	88,239
N. Y.	.....	.....	.....	.....	34,015
Neb.	.....	.....	.....	.....	5,000
Total cut...	2,170,107	4,323,484	6,493,591	6,908,870	8,160,973
Wire...	.....	.....	1,500,000	1,250,000	600,000
Total nail production...	.....	.....	7,993,591	8,158,870	8,760,973

The rapid displacement of Iron Nails by Steel Nails which has been noticed during

the last few years was continued in 1888, about two-thirds of the total production of Cut Nails in that year being made of steel. In 1884 the production of Steel Nails in the United States (including 500 kegs of combined Iron and Steel) was only 393,482 kegs, or 5 per cent. of the total production. In 1885 the production of Steel and combined Iron and Steel Nails was 1,823,127 kegs, or 27 per cent. of the total production. In 1886 the production of Steel Nails alone was 2,968,989 kegs, or 36 per cent. of the total production. In 1887 the quantity of Steel Nails produced exceeded that of Iron Nails, being over 50 per cent. of the total production; and in 1888 the Steel Nails made amounted to over 66 per cent. of the total production. California made 215,000 kegs of combined Iron and Steel Nails in 1888, and Massachusetts made 3577 kegs. We have classed these in the table with Iron Nails.

The leading Cut-Nail producing district of the United States is known as the Wheeling district. It embraces four counties, all bordering on the Ohio River—Ohio and Marshall counties in West Virginia, in which counties all the nail works of the State are located, and Belmont and Jefferson counties across the river in Ohio, the city of Wheeling being near the center of the district. A widely extended section of Central Pennsylvania, embracing 11 counties drained by the Susquehanna River and its branches, has for several years constituted the next most important Cut-Nail district of the country. Many years ago, however, Allegheny County, Pa., was the leading district in the country, but it has now fallen far behind. The following table shows the production in kegs of Iron and Steel Cut Nails in all these districts in the last five years.

Dist.	1884.	1885.	1886.	1887.	1888.
Wheeling...	1,991,570	1,297,136	1,858,551	1,848,116	2,187,845
Central Penn.	1,063,996	1,472,797	1,489,482	1,222,400	1,109,377
Alleghy Co., Pa.	459,512	176,258	121,441	277,410	232,762

The decline in the Wheeling district in 1885 was due to a prolonged strike, which benefited the Central Pennsylvania district.

## Miscellaneous Prices.

The Freezers made by the Gooch Freezer Company, Cincinnati, Ohio, are sold at the following discounts:

	Discount.
Peerless.....	60&10 %
Giant.....	60&10 %
Zero.....	65&10 %
Pet.....	65&10 %
Boss.....	65, 10&10 %

The D. M. Steward Mfg. Company, Chattanooga, Tenn., issue circulars relating to their Metal-Workers' Crayons, Rolling-Mill Crayons, &c. These goods, in case lots, are sold at the following prices, subject to a discount of 25 per cent.:

	Per gross.
Metal-Workers' Crayons.....	\$2.50
Rolling-Mill Crayons.....	2.50

On five-case lots or more a special discount is made.

The Gibbs Lawn Rake Company, Canton, Ohio, quote their Lawn Rakes and Post-Hole Diggers at the following prices: Gibbs Lawn Rakes, discount 50 and 15 per cent.; Canton Lawn Rakes, discount 50 and 10 per cent.; Gibbs Post-Hole Diggers, \$30 per dozen, subject to a discount of 50 per cent.; Imperial Post-Hole Diggers, subject to a discount of 45 per cent. The company report that their sales to date are in excess of last season, which, considering the slowness of trade, is regarded as indicating the favor with which they are received by the trade.

The following are the prices of the Economy Ice-Cream Freezer, manufactured by the Kingery Mfg. Company, Cin-

cinnati, Ohio, for whom the Alford & Berkele Company are special agents, 77 Chambers street, New York:

	Per dozen.
2 Quart.....	\$10.56
3 Quart.....	12.60
4 Quart.....	13.80

Referring to the business of the present year, a leading Pittsburgh jobber writes as follows:

Our volume of business the first quarter of 1889 is much larger than it was the corresponding period of last year. Prices are lower than I have ever known them in almost everything in our line of goods. Manufacturers of Nails and many other lines of Hardware can only be running their works at a loss. Even at loss they are obliged to run, for the loss would be great to shut down. Their trademust be held, and idle machinery depreciates as much as that which is worked.

Granite and Agate Ware are still sold to a considerable extent from the old list, the new list not having yet come into general use.

## Obituary.

George H. Churchill, of the Hardware firm of Clark, Churchill & Co., Bloomington, Ill., died April 3. He had been sick for a few days, but was not considered dangerously ill until within a few moments of his death. At noon on the preceding Sunday he was taken ill with what the physicians pronounced diphtheria, but though kept from his business he was able to be about the house. He was 37 years of age and was a native of Portland, N. Y., and for six years a resident of Bloomington. He is referred to as among the promising merchants of his city, with many of the qualities that go to make a successful man, and the manner in which he is referred to indicates the esteem in which he was held.

## Items.

Morley Bros., East Saginaw, Mich., have issued a large and imposing catalogue representing the varied lines which they are offering as jobbers and manufacturers. It is a volume of more than 1000 pages, clearly printed, well arranged and strongly bound, making a serviceable catalogue which will be appreciated by their customers. The title page is engraved and represents the different buildings occupied by the business of the house, including the stores, factory and warehouse. It is evident that in the arrangement of this volume the effort has been made, and successfully, to secure the display of a large variety of goods in as small a space as is consistent with their suitable representation and the full descriptive matter. It is also to be noticed that the line of goods represented in the volume is very large, including in addition to the regular line of Hardware, Tools, House-Furnishing Goods, &c., a line of Wooden-Ware, Tinware, Harness, Saddlery Hardware and Whips, Paints, Oils, &c., Electrical Supplies, Brushes, Showcases and other goods of interest to the trade. In the department devoted to the goods manufactured by them the Blue Line Lumbering Tools, Ox Yokes, Ox Bows, &c., are given a prominent place, while their Railroad Stepladders are also illustrated and their construction shown. A pleasant effect is produced by the introduction of colored labels, as on Axes, and the bronze finish applied to other goods, thus giving a touch of color, which adds to the attractiveness of the volume. In nearly all cases list prices are given on the goods, the lists being carefully revised up to date. The volume closes with a number of tables in regard to staple goods, giving the weight, number, thickness, &c., and other useful information. It is a valuable addition to the Hardware trade literature.

The Hulbert Fence and Wire Company, St. Louis, Mo., have issued catalogue No. 12 for 1889, and in it show an enlarged



line of Wire Goods, of which illustrations are given with appropriate descriptions and list prices.

The Samuel Winslow Skate Mfg. Company, Worcester, Mass., issue a circular describing the Vineyard Bicycle, of which illustrations are given, with a statement of its special features.

Hubbard & Co., Pittsburgh, Pa., announce that the destruction of their works in Pittsburgh on the 7th inst. will not prevent the prompt execution of orders for Axes and Hoes, provided they are furnished with specifications immediately, the large capacity of their Beaver Falls works having been increased to meet all demands for these lines. On Saws and Shovels they will, however, be temporarily suspended.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., under date April 2, have issued their catalogue No. 102, devoted to goods connected with summer sports. To this interesting line 48 pages are devoted, with copious illustrations and list prices.

C. E. Hudson, Leominster, Mass., advises us that he has recently made arrangements with three large wholesale houses in Canada—Haverhill, Learmont & Co., and Benny, McPherson & Co., of Montreal, and Wood & Leggat, of Hamilton, Ont.—to have the entire sale of his Rocking Table and Little Star Apple Parers in that country the present year, and has already received orders from them for about 1000 dozen machines. He advises us that he will fill no orders from other parties there this season.

R. Hoe & Co., New York, have issued their Saw catalogue for 1889, in which special attention is given to their Chisel-Tooth Saws, the special features of which are illustrated.

"Syracuse and Its Surroundings" is the title of an artistic pamphlet representing that city, its public buildings, principal industries, &c., together with a number of very tasty sketches of scenery in the vicinity. Among the business houses thus represented are the works of E. C. Stearns & Co., the illustration of which indicates their extent and completeness.

The catalogue of Indurated Fibre Ware issued by Cordley & Hayes, 173 and 175 Duane street, New York, gives a description of the various lines, their uses and dimensions, while interesting information is also given in regard to the process of manufacture. Retail prices only are quoted, from which a trade discount of 25 per cent. is given. It is also stated that Pails are now painted to represent the Indurated Fibre Ware, and that other imitations are being put on the market.

Schulte, Lohoff & Co., Evansville, Ind., issue a price list of their line of Edge Tools, including Shingling, Half, Lath, Claw, Solid Steel Shingling and Broad Hatchets, Carpenters' and Ship Carpenters' Adzes, Butchers' Choppers, Kitchen Cleavers' and Carpenters' Pincers, of which they have been manufacturers for two years. They allude to their goods as being in excellent demand and are contemplating the building of a new addition to meet the requirements of their trade. They are now running exclusively on Tools and Steel Castings, which are cast from crucible furnaces.

The Corbin Cabinet Lock Company have on exhibition in their Chicago salesroom, 63 Washington street, a specimen cabinet of post-office boxes, equipped with their new post-office lock. The boxes have a metallic framework in front, of ornamental design. The doors are metal, with a glass inserted in each, to permit the interior to be seen. The locks are very ingeniously constructed, each lock being of the same pattern, yet each being capable of an arrangement of the tumblers so that no two keys are alike. A master key, to be used by the postmaster alone, will unlock any of the locks from the inside in case a key should be lost and it becomes necessary to reset the lock to a different combination of the tumblers. The keys are small and flat. The cabinet of boxes shown has 26 compartments, and is suited to the requirements of a post office in a town of 300 or 400 inhabitants. The post office at Peoria, Ill., was recently fitted with boxes of this pattern. They have also been put into the post office at Council Bluffs, Iowa. The post offices of Evanston and Lake View, Ill., are now having them put in. A large number of offices in large and small towns in various other parts of the country are using them.

On the 10th inst. what is said to be the longest train of Farming Implements that ever crossed the continent arrived in Chicago from Massillon, Ohio, and left at 10.40 a.m. on a special over the Wisconsin Central Railroad, the destination being Portland, Ore. The train, which consisted of 26 cars, the first 5 of which were equipped with air-brakes, stood in the Forty-eighth street yards, and was admired by the officials of nearly every road centering in Chicago. The value of the Implements, which included 46 Threshers, 32 Farm Engines, and 24 Horse-Powers, is estimated at \$80,000. From the engine to the caboose a long white streamer was stretched, on which was painted in black letters "Russell & Co., Massillon, Ohio. To Russell Farming-Implement Company, Portland, Ore. The longest train of its kind that ever crossed the continent." The train was taken through on passenger time, and was expected to arrive at its destination in a week from its departure from Chicago.

Matthai, Ingram & Co., Baltimore, Md., have issued their catalogue of summer goods. It refers to Water Coolers, Refrigerators, Freezers, Vapor and Gasoline Stoves and a variety of Tinware. It is accompanied by a discount sheet and leaflets calling attention to such specialties as the Gem Apple Corer, Acme Stove-Pipe, Fly Fans, the Favorite Baking Pan, &c.

The American Machine Company, Philadelphia, Pa., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, issue a striking showcard and other advertising matter illustrating their Gem Ice-Cream Freezer, and also a circular setting forth some of the merits possessed by it and their Ice Tools.

The George Worthington Company, Cleveland, Ohio, have issued a convenient spring circular showing an attractive line of seasonable goods, to the display of which more than 50 pages are devoted. Steel goods are naturally given a prominent place, and are followed by Shovels, Spades, Post-Hole Diggers, Floral Sets, Wheelbarrows, Grindstones, Lawn-Mowers, Refrigerators, Bird-Cages, Sheep-Shears, &c. It thus represents, of course, only a small portion of the extensive line carried by the company.

The issue of *Lock and Bell* for the present month contains 24 pages, having been again enlarged, so that it is now just double the size it was when first started, in October, 1887. This expansion is a gratifying evidence of its success, which is based upon the enterprise and skill with which it is made to occupy its field.

T. E. Parker, connected with the *Ironmonger*, of London, England, is at present in this country visiting the various trades of general interest to that journal. He leaves New York to-day (Thursday) for an extended trip, stopping at Philadelphia, Baltimore, Pittsburgh, Cincinnati and St.

Louis, and returning by way of Chicago, Cleveland, Buffalo, Toronto, Montreal, Boston and New Haven. Mr. Parker has resided for some time in South America and South Africa, and is familiar with the requirements of the Hardware trade in those portions of the globe.

E. M. Richardson, Waltham, Mass., in his circular relating to his Shedd's Blind-Fast, calls attention to its special features, and emphasizes the fact that it has a coil spring and is attached by means of a screw, and does not drive into the blind, like others made in imitation of it. The quality of the Fastener is also alluded to.

Richardson Bros., Newark, N. J., have issued a new catalogue bearing date January 1, 1889, in which they represent their well-known line of Saws. In their introductory remarks they state that since their last issue they have greatly increased their facilities by the introduction of new machinery, and refer to the gratifying testimonials which they have received from the trade in regard to the quality of the goods. They also call attention to the excellence of the shipping facilities with which the city of Newark is provided, the rates over leading fast freight lines being the same as from New York. They allude specially to their new Butcher Saws, which are shown on pages 53 to 55, and their patent improved Blade Tightener, the simplicity and efficiency of which is referred to. In addition to their line of Saws the catalogue also represents Scrapers, Plastering and Brick Trowels, Molders' Tools, Cane Knives, Screw-Drivers, &c.

Announcement is made that the firm of Wilcox, Brother & Co., Adrian, Mich., has been dissolved, H. H. Wilcox retiring. Geo. A. Wilcox, Wm. A. Stanford and Wm. S. Wilcox have purchased the entire interest of the late firm, and will conduct the business at the old stand under the firm name of Wilcox Hardware Company.

There has been a consolidation of the Hardware business of Wells-Stone Hardware Company and A. B. Chapin & Co., both of Duluth, Minn., under the name of Chapin-Wells Hardware Company.

Chas. L. Pierce & Co. are representing Hardware manufacturers in San Francisco, Cal., and are, we are advised, at the present time agents for Hubbard & Co., Pittsburgh, Pa., J. F. Wollensak, Chicago, Ill., Burke Mfg. Company, Youngstown, Ohio, James L. Haven Company, Cincinnati, Ohio, and Kline Mfg. Company, Chicago, Ill., and are negotiating with a view to other agencies. Mr. Pierce has been for some time with the John Russell Cutlery Company, having previously been long connected with the A. F. Shapleigh Hardware Company, St. Louis, and is widely known to the trade, and will have their best wishes in this new departure. In connection with their office it is intended to have a collection of catalogues and price-lists of manufacturers, which will be placed at the service of those in the trade desiring to consult them.

C. J. Bailey & Co., 132 Pearl street, Boston, Mass., issue circulars describing their manufactures in the line of Rubber novelties, including principally Brushes, among which is a Dauber which is referred to as having special advantages.

The Hotchkiss and Upson Company, Cleveland, Ohio, issue a circular illustrating their patent Nut-Lock Track Bolt with solid slot. They explain its construction and use, and allude to the advantages possessed by it.

Enterprise Mfg. Company, Philadelphia, Pa., under date 12th inst., issue a circular to the Hardware trade stating that they have procured new molders to take the place of those who struck and are now in position to fill all orders promptly. They



when wanted, while at the same time it opens the trap door. The weight by which it is operated is entirely out of sight in the rear of the shelving. There is also a cord running from the bottom of ladder through a pulley in the ceiling back of the weight. This device is original with Mr. Ziegler, and is found to be exceedingly convenient

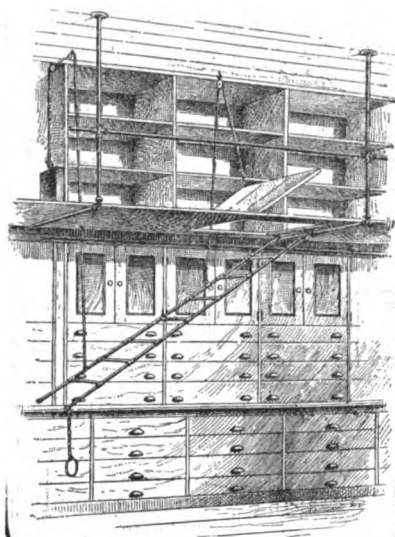


Fig. 335.—Arrangement of Hanging Walk.

and satisfactory. The shelving around the entire store extends from the floor to the ceiling.

It will be observed that in the front of the store opposite the entrance there are some 40 feet of showcases forming three sides of a rectangular parallelogram, which is devoted to Notions, Sporting Goods, Base-Ball Goods, Fishing Tackle, Pocket and Table Cutlery, &c. In the rear of this is the Sporting Department, in which are two pillars which are surmounted by large circles 7 feet in diameter, which are used for suspending Bird Cages, Tin Buckets and Lanterns, thus making a

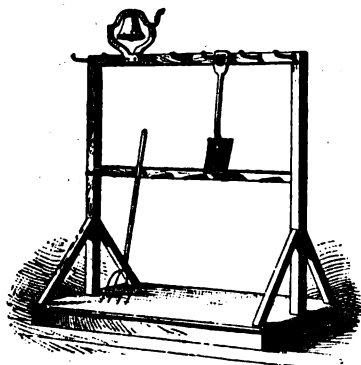


Fig. 336.—Steel Goods and Bell Rack.

good display when properly arranged. Underneath these circles there are smaller ones which are used for Brushes, Tackle Blocks, Steel Traps, Dog and Coil Chain, &c. There are seven of these pillars in the store and each of them is surmounted with such circles.

Toward the rear of the store there are counters with samples of Vises, Wagon Jacks, Lifting Jacks, &c. Next is a Steel Goods and Bell rack, represented in illustration, Fig. 336. Opposite this rack, on the south side, there are bins under counters, in which are kept Wire and Cut Nails, Staples and Horseshoes. Fig. 337 shows some of these bins with the Rope coming through the floor on the end of counter from reels in basement.

In the northeast corner of the store there is shelving for Japanned-Ware, also

a stationary gas pipe which runs up to the hanging walk on the north side of the store. Other details in regard to the arrangement may be gathered from the full and complete diagram, Fig. 338.

In connection with the establishment there is an annex on the opposite side of the street, which has a frontage of 23 x 90 feet, and is used as a sample-room for all kinds of Farm Machinery, Wagons, Wind-mills, &c. In the rear of this room there is another, 23 x 50 feet, used for Bar Iron, Steel, Coil Chain, &c., and back of this a warehouse, 36 x 70 feet, devoted to Farming Implements, Gas-Pipe and Fittings, Pumps, &c., and in connection with this warehouse a farm-wagon shed, 20 x 100 feet.

#### Improvements in Hibbard, Spencer, Bartlett & Co.'s Stores.

We have previously alluded to the extension of Hibbard, Spencer, Bartlett & Co.'s establishment at Chicago by the addition of the two store buildings adjoining them on the east. These buildings have now been connected with the main business block by the opening of

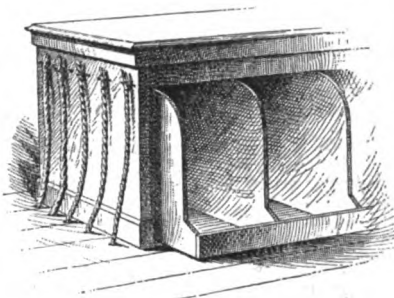


Fig. 337.—Counter with Bins, Rope, &c.

suitable passageways through the partitions on the several floors, and are being rapidly converted to the use of special departments. Each building has a depth of 140 feet, a width of 25 feet and a height of five stories, thus adding immensely to the capacity of this huge Hardware emporium. The room on the ground floor of the first new building to the east, which is No. 20 Lake street, will be used as a sample-room for House-Furnishing Goods. It extends the full depth of the block, and is being handsomely finished on both walls and ceiling. It is the express intention of the firm to make this the finest sample-room for House-Furnishing Goods in the country. The floors above will be devoted to stock. The room on the ground floor in the other new building, No. 18 Lake street, will be used as a sample-room for Lamps and Glassware, not including Crockery. It also extends the full depth of the block, and affords ample room for a magnificent display of goods, now very largely in place and ready for inspection by buyers. The floors above this room are intended for packing and for storing stock.

The Lamp and Glassware department of this house will carry the largest stock in Chicago of either kind of goods. The samples show a bewildering variety of Lamps, Shades, and all the fixtures and appliances pertaining to the Lamp business. All kinds of Lamps are shown, ranging from the plainest and cheapest to the most elaborately decorated and dearest. The stock is one from which a perfect selection can be made to suit any locality and all eccentricities of taste. The Hanging Lamps run from \$1.25 each up to, say, \$30, or as high as any buyer would wish to go. They are resplendent in jewels, prisms, tinted glass shades, decorated shades of delicate or brilliant colors, and most artistic brasswork, some remarkably

fine specimens of *repoussé* work being embraced in the collection. In contradistinction to the policy of other Lamp and Glassware establishments of Chicago, but in harmony with the customs of this house in other departments, no goods are sold at retail, but an exclusively jobbing business is conducted, so that a retail merchant knows here, at least, his customers cannot purchase the special goods they want and at as low prices as himself. Special salesmen are employed for this department, and it is managed by men who thoroughly understand the requirements of this branch of trade. The remarkable success achieved by Hibbard, Spencer, Bartlett & Co. in selling Lamps, may be regarded as an indication of the possibilities of this more extended department under the management of trained specialists.

The addition of these two buildings gives the firm more space for their packing department, which had been badly needed. They now have five packing-rooms, each extending the full depth of the block, 140 feet, four of them being 25 feet wide each and one 50 feet wide. In these rooms from 40 to 50 packers are at work all the time, which conveys some idea of the immensity of the business transacted. Several elevators are now in use in the different buildings, each elevator having its special assignment of freight. For instance, some take goods up exclusively, others take goods down only, and others are for the carriage of clerks and passengers generally.

In going through this large business block the visitor is impressed by the methods which have been devised to economize space, as he would naturally suppose that ample room would be found for everything. Shelving is put up in every available quarter in which to show stocks of goods, and bins innumerable extend on every hand. The stock-room for Pieced Tinware, for instance, is quite a curious sight. It is about 14 feet high and 25 feet wide and extends almost the entire depth of the block. On one side of this room a row of bins extends along the partition from the floor to the ceiling 4 feet deep, and on the other side the bins are 10 feet deep, leaving a passageway 11 feet wide between, which about affords room enough for the porters to pass with their trucks bringing in and taking out goods. A force of carpenters is constantly employed in putting up shelving, making and arranging bins, and otherwise reconstructing and repairing.

Incandescent electric lights are used throughout this establishment, so that no matches need to be lighted in any part of it, thus reducing to a minimum the danger of fire, which always accompanies the use of gas.

The rapid filling up of the new additions with samples and packages shows how much the space thus gained was needed. Whether the firm have thus attained their full growth remains to be seen. But as they are constantly increasing and extending their lines and pushing their trade, with the evident determination to keep in the fore-front in the Northwest, the further expansion of their facilities would seem to be predestined.

#### Exports.

PER BARK E. SUTTON, APRIL 1, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By R. W. Forbes & Son.—1 Spring Wagon, 1 set

Harness, 1 box Electric Batteries.

By Des Bruij & Allen.—200 Plows and Parts, 10

Shellers.

By Carr & Hobson.—7896 pounds Plows and Plow

Woods.

By Corner Bros. & Co.—200 Plows, 4½ dozen

Clocks, 5¼ dozen Brooms.

By Carey, Gale & Lambert.—128 pounds Sash

Cord, 6220 pounds Sash Weights.

By A. Field & Co.—7 dozen Rakes, 1500 pounds

Nails, 15,000 Cartridges, 24 Blocks, 20 dozen

Handles, 6 dozen Braces, 3 dozen Meat Cut-

ters, 36 Scales, 24 Traps, 2 dozen Locks, 15

dozen Axes.

By Arkell & Douglas.—13 cases Handles, 1 bundle

Sash Cord, 816 pounds Sash Weights, 1 case

Hardware, 6 Ladders, 1 case Planes, 8 cases Clocks, 1 case Augers, 36 dozen Handles, 14 gross Polish, 1 case Pumps, 4 bundles Pipe, 12 dozen Trucks, 17,000 Spokes, 1 dozen Rims, 24 dozen Brooms, 2 Washers, 6 dozen Axes, 1 case Hardware.

By *W. H. Crossman & Bro.*—2 dozen Wagons, 2 cases Slates, 1 case Wagon Jacks, 2 dozen Washboards, 15 dozen Brooms, 8 Churns, 5 boxes Clothes Pins, 2 dozen Traps, 1 dozen Saws, 11 cases Plow Parts, 14 dozen Hay Forks, 14 dozen Carriages, 5 cases Sash Weights, 2000 pounds Nails, 2563 pounds Barb Wire, 1 dozen Clocks, 6 cases Hardware, 8 dozen pails, Axle Grease, 10 Hand Carts, 75 Plow-Wheels.

By *Coombs, Crosby & Eddy.*—24 Plows and Parts, 12 cases Sash Weights, 1 case Sash Cords, 25 dozen Brooms, 9 Pumps, 12 dozen Edge Tools, 22 dozen Axe and Pick Handles, 3 Hay Cutters, 1 dozen Hose Couplings, 112 Plows and Parts, 36 dozen Axe Handles, 5000 pounds Nails, 50 dozen Edge Tools, 4 barrels Fuse, 40 dozen Edge Tools, 1000 Broom Handles, 2 dozen Handles, 52 cases Ladders, 96 Plows and Parts, 60 dozen Axe and Pick Handles, 762 pounds Slate, 70 dozen Edge Tools, 2600 pounds Nails, 25 boxes Clothes Pins, 2 Wooden Scoops, 20 dozen Edge Tools, 15 Scales, 10 dozen Picks, 96 Plows and Parts, 240 dozen Brooms, 29 pounds Sash Cord, 6 dozen Sash Fasteners, 6 dozen Clocks, 13 dozen Padlocks, 4 dozen Agricultural Hardware, 8 gross Hardware, 1150 pounds Sash Weights, 36 Sewing Machines.

PER BARK REDFORD, APRIL 8, 1889, FOR BUENOS AYRES, ARGENTINE CONFEDERATION.

By *J. B. Woodward.*—3000 pounds Wicks, 40 gross Shoe Polish, 100 gross Blacking, 2000 pounds Shoe Nails, 2500 pounds Shoe Tacks, 307 Corn Shellers, 301 Plows and Repairs, 10 dozen Axes, 10 dozen Hay Knives, 48 dozen Hat Racks, 38 dozen Bit Braces, 178 dozen Clocks, 2 dozen Washing Machines, 25 Hay Rakes and Repairs, 24 packages Tinner's Tools, 50 dozen Hatchets, 2 dozen Nail Pullers, 440 Sewing Machines and Repairs.

By *Samuel Lees & Co.*—6 cases Pumps, 6 crates Steel Door Mats, 4 cases Grindstones, 2 cases Carpet Sweepers, 2 cases Hardware, 2 cases Fly Fans, 1 case Hatchets.

By *J. Norton & Son.*—25,000 Carbons, 1860 pounds Wagons, 80 crates Blacking.

By *J. H. Snyder.*—230 packages Windmill and Tower, 7 Wagons, 25 dozen Hoes and Scrapers, 230 Plows and Cultivators, 60 dozen Axes, 20 Corn Shellers, 12 Churns, 61 Meat Cutters and Stuffers.

By *Pearce & Jones.*—41,000 feet Wire, 4000 Gun Insulators, 70 coils Wire.

By *Stevens, Corwin & Co.*—1 case Hardware, 12 cases Hardware, 300 pounds Twine, 12 Clocks, 30 cases Iron Nails, 6 Ranges, 2 Wagons, 3 Iron Saws.

By *Healy & Earl.*—20 Horse Rakes, 6 Harrows, 48 Corn Mills and Repairs.

By *Abendroth Bros.*—115 Stoves and Parts.

By *W. Lunham.*—1 Windmill.

By *F. H. Lovell & Co.*—5444 pounds Lamp Goods.

PER BARK ANNIE J. MARSHALL, MARCH 27, 1889, FOR BUENOS AYRES, ARGENTINE CONFEDERATION.

By *John Dunn, Son & Co.*—6 Shellers, 120 Mills, 216 dozen Plow Parts, 388 dozen Plows, 1500 dozen Lamp-Ware, 56 Mowers, 222 dozen Tools, 200 Clocks, 45 dozen Blocks, 400 dozen Brushes, 100 dozen Wrenches, 1000 gross Wicks, 4500 pounds Wicks, 240 gross Clothes Pins, 74 dozen Cutters, 8 dozen Trucks, 12,000 pounds Horse Nails, 100 Scales, 1500 dozen Handles, 110 dozen Hardware, 37,000 pounds Tacks, 15,000 pounds Shoe Nails, 200 dozen Scales, 10 dozen Beaters, 40 gross Sewing Machine Oil, 5 dozen Stuffers, 20 gross Traps, 200 gross Blacking, 40 dozen Knives, 5 dozen Irons, 800 dozen Forks, 1000 dozen Slates, 48 Shellers, 50 dozen Saws, 40 dozen Cages, 275 dozen Brushes, 11,000 pounds Shoe Nails, 50 dozen Hammers, 25 Scales, 12 Washing Machines, 15 packages Scales, 400 dozen Hatchets, 100 dozen Handles, 24 dozen Rakes, 30 dozen Hammers, 125 dozen Wheelbarrows, 30 Scales, 3 dozen Wheelbarrows, 50 dozen Scoops, 60 dozen Hat Racks, 8 Corn Mills, 18 Clocks, 277 dozen Tools, 404 dozen Corn Shellers, 106 dozen Washboards, 12 Stoves, 4 dozen Lamp-Ware, 60 Plows, 300 dozen Locks, 447 dozen Edge Tools, 4 dozen Lamp-Ware.

PER BARK H. BREMER, APRIL 6, 1889, FOR PORT NATAL, SOUTH AFRICA.

By *R. W. Cameron & Co.*—75 Plows.

By *New Home Sewing Machine Company.*—51 cases Sewing Machines.

By *Corner Bros. & Co.*—94 packages Hardware, 4 packages Agricultural Implements, 35 packages Hardware.

By *W. H. Crossman & Bro.*—12 cases Plow Parts, 5 cases Plow Parts, 18 cases Hardware, 6 gross Polish, 12 dozen Carpenters' Tools.

By *R. W. Forbes & Son.*—1 case Lamp-Ware, 24 dozen Ladders, 40 dozen Axe Handles, 23 dozen Axes, 20 boxes Scales, 6 dozen Saws, 74 dozen Axes, 12 boxes Wringers, 1 case Toys, 14 boxes Clocks, 3 Mangles, 12 packages Stoves, 162 packages Plows and Parts, 6 packages Corn Shellers, 60 dozen Brooms, 8 packages Churns.

By *Marcial & Co.*—30 dozen Brooms, 500 Handles, 5 dozen Washboards, 5 dozen Washboards, 2 dozen Varnished Pails, 3 dozen Brackets, 18 Corn Shellers, 15 pairs Axes, 4 Corn Shellers, 63 dozen Bolts, 10 dozen Axes, 2 dozen Axes, 7 dozen Wrenches, 6 dozen Hatchets, 30 Pumps, 25 dozen Spade Handles, 31 dozen Axes and Hatchets, 650 pounds Wire Nails, 30 Planes and Levels, 18 dozen Spades, 12 dozen Spades, 39 dozen Locks and Knobs, 13 cases Wheel Parts, 1 dozen Choppers, 14 dozen Tobacco Cutters, 5 cases Irons, 2 Quaker Mills, 2 dozen Mill

Pick Blades, 14 dozen Handles for same, 14 dozen Cages, 10 dozen Hammers, 84 dozen Trowels, 4 dozen Knives, 6 dozen Saws, 10 dozen Saws, 18 dozen Saws, 10 dozen Axes, 6 Boston Trucks, 1000 pounds Horseshoes, 5 dozen Brackets, 12 dozen Can Openers, 44 dozen Bench Vises, 1 gross Carriage Knobs, 3 gross File Handles, 74 dozen Brackets, 6 dozen Chisel Handles, 2 cases Hardware, 1 dozen Hand Screws, 2 dozen Wood Bench Screws, 112 pounds Oil Stone, 1 dozen Charcoal Iron, 32 dozen Lines, 1 case Handles, 1 case Gauges, 14 dozen Axl Hafta, 6 dozen Locks, 2 dozen Axes, 36,500 pounds Nails, 8 Shellers, 4 Shellers.

PER SHIP TROOP, APRIL 8, 1889, FOR MELBOURNE, AUSTRALIA.

By *F. B. Wheeler & Co.*—23 sets Harness, 6 dozen Velocipedes.

By *Winchester Repeating Arms Company.*—18 Guns, 50,000 Primers, 12,000 Loaded Shells.

By *Meriden Britannia Company.*—5 packages Plated-Ware, 6 boxes Plated-Ware, 3 boxes Plated-Ware.

By *Simpson, Hall, Miller & Co.*—500 pounds Plated-Ware, 500 pounds Plated-Ware, 750 pounds Plated-Ware.

By *Nevius & Haviland.*—4079 Shade Rollers.

By *A. Field & Co.*—1 case Links, 109 pounds Tacks, 650 dozen Hardware, 146 pounds Paint, 566 pounds Malleable Iron, 26,700 Bolts, 370 dozen Hardware.

By *R. Irwin & Co.*—120 dozen Fruit Jars.

By *Healy & Earl.*—1 case Planing Machine, 8 cases Governor Valves.

By *Welsh & Lea.*—10 cases Axes, 3 cases Handles, 2 packages Meat Choppers.

By *Wheeler & Wilson Mfg. Company.*—302 Sewing Machines.

By *Ansonia Clock Co.*—61 boxes Clocks, 30 boxes Clocks, 56 boxes Clocks, 34 boxes Clocks, 20 Boxes Clocks.

By *Sargent & Co.*—61 cases Hardware, 17 packages Castings, 4 boxes Castings and Bells.

By *White Sewing Machine Company.*—5194 pounds Sewing Machines.

By *Edward Miller & Co.*—40 packages Lamp Goods.

By *Coombs, Crosby & Eddy.*—7 dozen Hammers, 8 dozen Rakes, 24 dozen Wood Handles, 6 dozen Hatchets.

By *U. James.*—2500 pounds Lawn Mowers.

By *W. K. Freeman.*—37 packages Hardware.

By *Singer Mfg. Company.*—977 cases Sewing Machines.

By *H. W. Peabody & Co.*—430 pounds Hammers, 7 cases Agricultural Implements.

By *Arnold, Cheney & Co.*—1 case Malleable Iron, 13 cases Hubs, 5 cases Spokes, 1 case Saddlery, 37 bundles Spokes, 3 cases Whips, 5 cases Iron Velocipedes, 63 cases Handles, 1 case Bolts, 52 cases Handles, 3 cases Bolts, 1 case Bolts, 24 packages Stoves, 21 cases Saws, 81,361 pieces Roofing Slate, 300 boxes Clothes Pins, 9 cases Axes.

By *McLean Bros. & Rigg.*—16 dozen Lamps, 12 dozen Chimneys, 25 dozen Plumbs and Levels, 4 dozen Cork Pullers, 250 feet Rubber Hose, 35 dozen Brackets, 66 dozen Axes, 177 dozen Drills, 2000 pounds Nails, 39 Refrigerators, 14 packages Lampware, 48 Mouse Traps, 12 dozen Gate Latches, 10 packages Grindstones and Parts.

By *W. H. Crossman & Bro.*—21 dozen Cow Bells, 4 cases Hardware, 3 cases Stone, 2 cases Hardware, 3 dozen Tin Kettles, 1 gross Graters, 2 cases Hardware, 84 dozen Braces, 168 pounds Stone, 9 packages Hardware, 8 cases Hardware, 18 dozen Hammers, 21 gross Whips, 1 bundle Handles, 93 dozen Axes, 24 dozen Hay Forks, 1 gross Graters, 312 dozen Handles, 22 packages Hardware, 33 dozen Axes, 7 dozen Churns, 1 gross Graters, 15 gross Sewing Machine Oil, 1 gross Vegetable Presses, 25 dozen Chimneys, 1 gross Graters, 12,000 Metallic Cartridges, 50 dozen Braces, 32 dozen Axes, 24 dozen Hinges, 5 cases Hardware, 12 dozen Braces, 8 dozen Valves.

By *Arkell & Douglas.*—2 cases Handles, 4 cases Plated-Ware, 2 crates Wheels, 1 bale Rubber, 117½ pounds Wagon Springs, 24 dozen Handles, 9½ pairs Shafts, 8 cases Carriage-Ware, 4 dozen Bars, 1 case Thermometers, 5 cases Hardware, 1 case Hubs, 3 cases Spokes, 2 dozen Wagon Jacks, 1 case Bolts, 6 cases Spokes, 1 case Hubs, 10 cases Nails, 1 case Sandpaper, 12 dozen Handles, 3 dozen Axes, 9 Refrigerators, 13 cases Traps, 521 pounds Nails, 8 cases Hardware, 2 cases Forks, 3 cases Hose, 3 packages Hammocks, 3 cases Blacking, 5 cases Grindstones, 2 gross Machine Oil, 35 cases Hardware, 27 cases Handles, 3 cases Hose, 27 cases Axes, 32 packages Hardware, 5 cases Bolts.

By *R. W. Cameron & Co.*—300 cases Wheels, 2050 pounds Pumps, 545 pounds Castings, 1700 pounds Sewing Machines, 2887 pounds Castings, 1240 pounds Castings, 1250 pounds Saw Machinery, 430 pounds Carts, 10 cases Sewing Machines and Parts, 21 cases Hardware, 37 bundles Spokes, 3 cases Carriage-Ware, 7 cases Carriage-Ware, 4 boxes Lampware, 1 case Carpet Sweepers.

By *R. W. Forbes & Son.*—3 cases Wringers, 18 dozen Fly Traps, 50 dozen Washers, 2 boxes

Plated-Ware, 1 case Clocks, 80 sets Axes, 34 packages Hardware, 1 gross Harness Oil, 1 case Sandpaper, 2609 pounds Bolts, 6 gross Fish Lines, 17 packages Fire Arms, 4 gross Sewing Machine Oil, 81 dozen Axes, 30 packages Stoves, 18 packages Hardware, 35 gross Lamp Wicks, 500 Broom Handles, 6 dozen Hoe Handles, 3 packages Plows and Parts, 5 cases Wringers, 9 cases Sad Irons, 46 packages Hardware, 3 packages Toys, 26,920 pounds Barb Wire, 22 cases Wringers, 20 dozen Fork Handles, 5030 pounds Carriage Bolts, 20 dozen Hoes, 6 dozen Rakes, 30 dozen Snaths, 1 case Stencils, 4 cases Wire Goods, 4 packages Agricultural Implements, 4 packages Fire Arms, 5 gross Axle Grease, 5 cases Kitchen Utensils, 4 packages Pails, 18 dozen Hatchets, 2 gross Casters.

By *Strong & Troubridge.*—1 case Cartridges, and Fire Arms, 14 cases Cartridges, 4 cases Tools, 1 case Nails, 1 case Wire Goods, 1 case Locks, 1 case Pumps, 1 case Mangles, 2 cases Handles, 3 cases Locks, 4 cases Tools, 2 cases Broom Handles, 3 packages Lampware, 3 cases Castings, 2 cases Traps, 30 kegs Nails, 1 case Toys, 3 cases Wringers, 1 case Hardware, 1 case Rivets, 5 cases Hatchets, 50 boxes Clothes Pins, 6 nests Pails, 1 case Hardware, 1 case Sluice Forks, 1 case Lampware, 1 case Locks, &c., 1 case Plated-Ware, 4 cases Choppers, 5 cases Nails.

### Spanish Iron Minerals.

It appears that the aggregate exports of iron ore from Bilbao last year amounted to 3,591,637 tons, as compared with 4,170,422 tons in 1887, and 3,160,047 tons in 1886. Of these exports, 2,481,435 tons were forwarded to the United Kingdom last year, as compared with 2,855,667 tons in 1887, and 2,151,137 tons in 1886. The United Kingdom alone absorbed 69 per cent. of last year's exports. Holland took 644,235 tons last year, as compared with 707,394 tons in 1887, and 534,687 tons in 1886. France ranked third with an importation of 347,687 tons last year, as compared with 356,980 tons in 1887, and 332,108 tons in 1886. The only other considerable importer was Belgium, which took 103,602 tons last year, as compared with 98,304 tons in 1887, and 98,442 tons in 1886. It will be seen that while Great Britain took 69 per cent. of the iron minerals exported from Bilbao last year, Belgium hardly took 3 per cent. Of the Spanish iron minerals exported from Bilbao last year to Great Britain, 558,091 tons went to Middlesborough, 476,641 tons to Cardiff, 861,262 tons to Newport, and 236,724 tons to Newcastle-on-Tyne. As regards France, 182,844 tons went to Dunkerque and 92,918 tons to Bayonne. The deliveries of iron minerals coastwise from Bilbao last year were 39,956 tons, as compared with 28,274 tons in 1887, and 25,181 tons in 1886. As regards the local consumption of Spanish iron minerals at Bilbao, it appears that the Vizcaya forges used last year 166,508 tons, the San Francisco del Desierto Works 113,392 tons, and the Bilbao Blast Furnaces Company 134,000 tons, making an aggregate of 413,900 tons. We learn that the ironstone mines of the Bilbao district will have to contend in future against the competition of iron minerals, which have been found to exist in other localities in Spain. The new mines are stated to be richer than those of the Bilbao district, and their minerals further contain an advantageous proportion of manganese.

It is reported that one of the blast furnace companies in the Lehigh Valley has purchased lately 7500 tons of non-Bessemer ore, guaranteed 58 per cent., at \$2.65, f.o.b. Escanaba, and an equal quantity of ore, guaranteed 60 per cent., at \$2.75, f.o.b. same port. The freight from Escanaba to Buffalo is \$1.05, and from Buffalo to the point in the Lehigh Valley, \$1.55, making the cost at furnace, of the 58 per cent. ore, \$5.25, and of the 60 per cent. ore, \$5.30. Foreign 55 per cent. ore has been offered at \$4.85, delivered at furnace.



**Daisy Lemon and Lime Squeezer.**

This article is put on the market by James D. Frary, Meriden, Conn., and is represented in the accompanying illustration, which indicates the manner of its use. In No. 40 the cup and the cone of the squeezer are coated with an elastic rubber material, and in No. 60 they are tinned. The rubber coating is referred to as very satisfactory for this use, as it is proof against lemon-juice. In using this squeezer it is placed on the top of tumbler or cup, as shown in the illustration, when,

*Daisy Lemon and Lime Squeezer.*

the handle being raised, a half lemon is placed with the left hand on the top of the cone, when the handle is pressed downward with the right hand. The squeezer being then held by the left hand, the juice is extracted readily by means of the pressure and one or two turns of the handle. The thoroughness with which it does its work and the fact that the juice of the lemon is obtained free from seeds and pulp and without soiling the fingers or clothing are points made in regard to this article.

**Knife-Balancing Machine.**

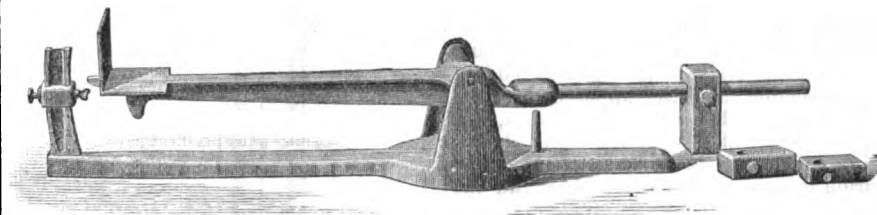
We present in the accompanying engraving a general view of a patent proportional knife-balancing machine manufactured by the Defiance Machine Works, of Defiance, Ohio. This machine is brought out to meet a well-defined want for a machine for perfectly balancing molding knives, planer knives, revolving cutters, knife cap screws, &c. In operating this machine each knife is placed in succession on the platform of the balancing machine with its face toward the end-board, shown at the left of the engraving. At the opposite

end of the beam is placed a suitable weight. If it is found that the knives are of the same specific weight, they are then placed in succession with their backs against the end-board just referred to. If they still appear to be of the same specific weight, they are then placed in succession flatwise on the platform in as many different positions as may be possible. By repeated trials it will thus be ascertained when they are all reduced to the same

and dies are employed in the manufacture, so all the parts are of uniform size and the work and cost of making them very much reduced.

**New Twine Box.**

We illustrate to-day a new twine box of ingenious pattern that is being put upon the market by the Wire Goods Company, of

*Knife-Balancing Machine.*

weight in their corresponding parts. The balance weights shown at the right in the engraving are made oblong, so that by placing the heavy end up the entire mass, consisting of weight, beam and knife, may be poised near its center of gravity and thus oscillate more sensitively. If, however, the object to be balanced be very heavy the weight must hang down. From an inspection of the engraving it will be seen that the operator can make the poise more or less delicate according to the varied positions of the knives to be balanced.

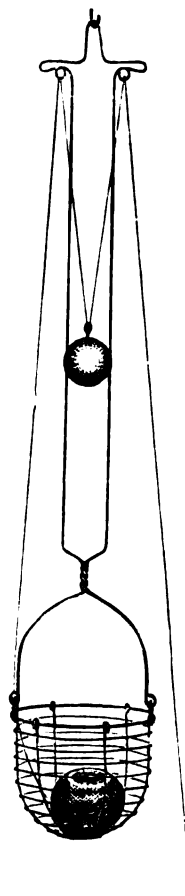
**The Perfection Funnel.**

A new form of funnel which possesses a number of advantageous features is manufactured by Augustus Gersdorff, proprietor of the Perfection Funnel Works, Bridgeton, N. J. The nozzle of the funnel, is, as will be noticed triangular in section with rounded corners, so that when it rests in the neck of a bottle there is ample space for the escape of the air. By this means the pouring can be done more rapidly, and the liquid is prevented from spilling out of the funnel by an inturned rim or edge. In the construction of the funnel each section is made of one piece of tin without the middle seam, which ordinarily makes a lodgment for dust and dirt and interferes with cleaning. Another feature of these funnels is the use of removable strainers,

*The Perfection Funnel.*

through which the liquid is passed as it enters the bottle. The strainers, having three notches in the edge, are held in position by small lugs formed in the seams of the funnel, and may readily be unseated and removed. The funnels are made of tin or copper tin-lined, and the shape of the pieces from which they are constructed permits the sheet metal to be cut with very little waste. Special presses

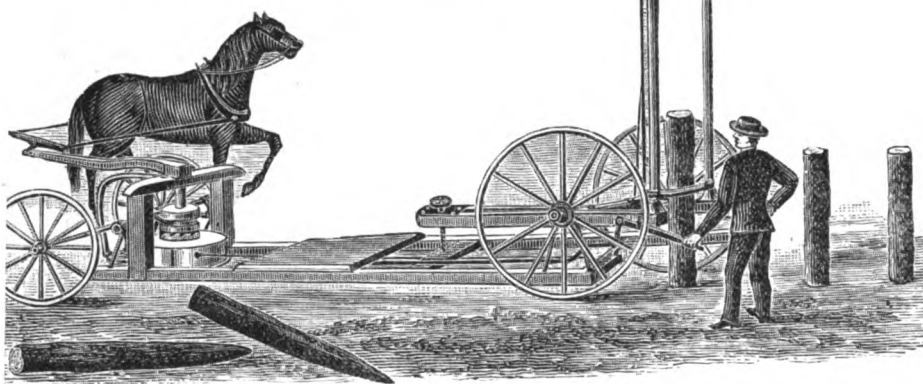
Worcester, Mass. The weight is suspended between two slides and the twine is threaded over it in such a way that as twine is drawn from the box the weight is lifted to the top of the slides. When sufficient string has been used and broken off, so that the twine is released, the

*New Twine Box.*

weight promptly drops to the bottom of the slides, and in doing so takes up the slack of the twine and draws it back to the position from which it started. By this very simple device the annoyance of snarled and unraveled twine is done away with, and the end of the string always hangs at the same point ready for the next one who shall come to use it. The Wire Goods Company announce that they will supply the twine boxes with attachments complete, as per the illustration, or they can supply the attachment separately, to be hung up over any twine box already in use, and to perform the same service that it does in the twine box complete.

**Post or Pile Driver.**

This machine is intended for light work, such as the driving of posts for wire fencing and the like. It is simple in construction and easily operated, and can be readily moved from place to place. When not in use, the hammer guides fold down and rest parallel with the body of the machine, thereby facilitating transportation. The guides are made of two pieces of pipe united at their upper ends by a yoke, and fastened at their lower ends into shoes hinged to the base. The winding drum is placed vertically at the opposite end of the machine, and the upper end of its shaft is provided with a sweep arm, and at its lower end is furnished with a clutching ring which may be disengaged from the drum to permit its free turning and the falling of the hammer. The clutch is automatically relieved by a lug projecting in the path of the hammer, which is suitably connected with the clutch. This lug can be placed at any desired height to regulate the stroke of the hammer. This machine is the invention of Oldham & Roberts,

*Automatic Fence-Post Driving Machine.*

3849 Finney avenue, St. Louis, Mo., by whom also it is put on the market.

**Logan's Patent Stall Drain.**

The accompanying illustration represents a stall flooring patented and manufactured by Martin Logan, 164 East Seventy-seventh street, New York. The lower part of the cut given represents the drain as placed in the stall, and the upper part shows the bed plate and slats, which are sold for the use indicated. The bed plate is 19 inches wide, 5 feet long, with gutters 1 inch wide, and is made of cast iron, the wood slats, inserted as indicated, being made of hard oak. The channels between each wooden slat act as independent gutters to carry the refuse off to the main gutter. It will be observed that it is constructed without the use of nails or screws to injure horses, and when the wood slats are worn they can readily be removed and replaced without the aid of a carpenter by lifting up the bed plate and sliding slats in place from the forward end of the plate. The manufacturer also points out the advantage it possesses in having the bed plate of iron, as promoting cleanliness in the stable and preventing soaking and disagreeable smells, and it is claimed that it will afford health and comfort to the horse, and prevent the rise of ammonia from injuring carriages. The slats are 2 inches wide and 2 inches deep, and the whole depth of plate and slat is 2½ inches.

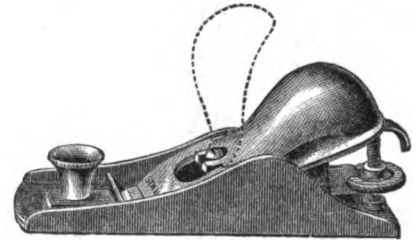
Some time ago we alluded to the alleged records in wire-rod rolling on which English manufacturers seemed to pride themselves. German makers, too, appear to regard their latest mills in the light of advanced practice. As a matter of fact,

American wire-rod mills are greatly ahead of anything that is being done in Europe. At Warrington, England, as we noted some time since, 870 to 400 tons rolled in one week was regarded as good work. In

work, the enormous advance made will be appreciated. If our English and German friends have anything approaching the records alluded to to show American wire-rod makers will be happy to learn of it.

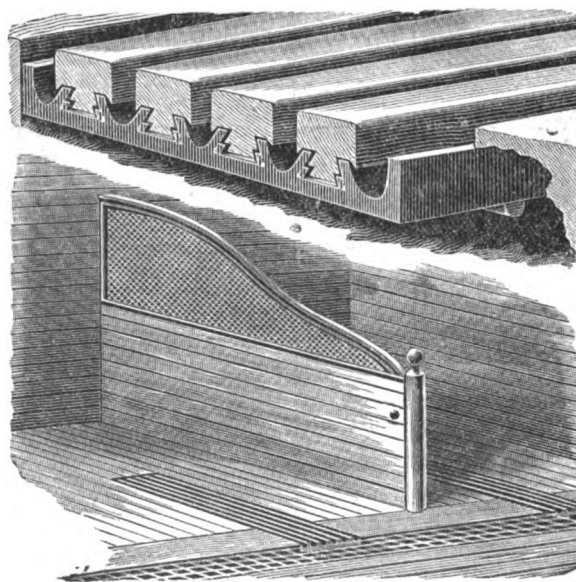
**Knuckle-Joint Block Plane.**

We present in the illustration herewith a general view of a knuckle-joint block plane recently added to the assortment of tools manufactured by the Stanley Rule and Level Company, of New Britain, Conn. By reference to the engraving it will be seen that the method of clamping the cutter in position is by means of a knuckle-joint in the cap above it, which also serves as a convenient hand-rest after the cutter is secured in place. By the use

*Knuckle-Joint Block Plane.*

of the brass thumb nut at the rear of the plane, the cutter can be set forward or drawn back, as may be desired. The curved lever under the cutter is designed for use in adjusting the cutter sidewise, so that the cutting edge may always be exactly straight with the face of the plane. The device is well made in all respects, and is claimed to be a very convenient tool.

A rigid specification to which steel rail manufacturers point as illustrative of the excessive requirements of some of the railroad companies, was given out lately in connection with bids asked on 1500 tons of 90-pound Reading section steel rails for the Manhattan Elevated Railroad of New York. The specification in question calls for a minimum of 0.45 and a maximum of 0.55 carbon, an analysis to be taken of

*Logan's Patent Stall Drain.*

have every reason to believe that at no distant date the works now under construction will come up to a rate of output of 100 gross tons per day of 12 hours, and that 1000 tons will soon become an average week's work, running double turn. When it is considered that in 1872 15,000 pounds was regarded as a very good day's

each heat; it calls for a testing of crop ends from each heat by a drop of 2000 pounds falling 18 feet, the permanent set of this being a part of the record. The maximum weight variation is one pound per yard; the rails are to be notched and drilled for the Fisher joint, and no variation above ¼ inch standard length.

# CURRENT HARDWARE PRICES.

APRIL 17, 1889.

*Notes.*—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.

<b>Caps, Percussion, "1000—</b>	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmed Edge, 1-10's.....	55¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
1-10's, 70's.....	75¢
Double Waterproof, 1-10's.....	\$1.40
Musket Waterproof, 1-10's.....	50¢
G. D.....	28¢
S. B.....	30¢
<b>Union Metallic Cartridge Co.</b>	
F. C. Trimmed.....	50¢
F. L. Ground.....	55¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof, in 1-10's.....	\$1.40
1-10's, 70's.....	75¢
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	\$1.60
<b>Cartridges.</b>	
Rim Fire Cartridges.....	50¢&52¢
Rim Fire Military.....	15¢&2¢
Cent. Fire, Pistol and Rifle.....	25¢&52¢
Cent. Fire, Military and Sporting.....	25¢&52¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., \$1.75.....	2¢
Blank Cartridges, 32 cal., \$3.50.....	2¢
Primed Shells and Bullets.....	15¢&52¢
B. B. Caps, Round Ball, \$1.75.....	2¢
B. B. Caps, Con. Ball, Swgd., \$2.00.....	2¢
<b>Primers.</b>	
Berdan Primers, \$1.00.....	2¢
B. L. Caps (for Sturtevant Shells) \$1.00.....	2¢
All other Primers, \$1.20.....	3¢
<b>Shells.</b>	
First quality, 4, 8, 10 and 12 gauge.....	25¢&10¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢&10¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	33¢&10¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢&10¢
Seibold's Comb. Shot Shells.....	15¢&2¢
Brass Shot Shells, list quality.....	60¢&2¢
Brass Shot Shells, Club, Rival, Climax.....	65¢&2¢
I. X. L. 10 and 12 gauge.....	40¢&52¢
"Special," 16 gauge.....	30¢&10¢
"Special," 10 and 12 gauge.....	40¢&10¢
Fowler's Pat.....	\$3.25
<b>Shells Loaded.</b>	
A. M. Co. List No. 19, 1887.....	20¢&10¢
<b>Wads.</b>	
U. M. C. & W. R. A.—B. E., 11 up, \$2.00.....	2.30
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.10
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.90
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	2.80
<b>Anvils.</b>	
Eagle Anvils, \$10.....	20¢&20¢
Peter Wright's.....	9¢
Armstrong's Mouse Hole.....	8¢
Armstrong's Mouse Hole, Extra.....	11¢
Trenton.....	9¢
Wilkinson's.....	9¢
J. & Riley Carr. Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢
<b>Anvil Vise and Drill.</b>	
Millers Falls Co., \$18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, \$3.00.....	40¢&10¢
<b>Apple Parers.</b>	
Advance.....	¢ doz \$4.75
Antimer Combination.....	¢ doz 5.50
Baldwin.....	¢ doz 5.25
Champion.....	¢ doz 7.25
Eureka, 1888.....	each 12.50
Family Bay State.....	¢ doz 12.00
Gem.....	¢ doz 5.25
Gold Medal.....	¢ doz 4.00
Hudson's New '88.....	¢ doz 3.75
Ideal.....	¢ doz 4.75
Improved Bay State.....	¢ doz 80.00
Little Star.....	¢ doz 5.00
March.....	¢ doz 5.00
New Lightning.....	¢ doz 5.50
Orion.....	¢ doz 4.00
Penn.....	¢ doz 4.00
Perfection.....	¢ doz 4.00
Pomona.....	¢ doz 4.00
Rocking Table.....	¢ doz 6.00
Turntable.....	¢ doz 13.50
Victor.....	¢ doz 4.50
Waverly.....	¢ doz 4.50
White Mountain.....	¢ doz 4.50
75.....	¢ doz 4.25
76.....	¢ doz 5.75
78.....	¢ doz 6.50
<b>Augers and Bits.</b>	
Douglas Mfg. Co.....	70%
Wm. A. Ives & Co.....	
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher, Cook's, Douglas Mfg. Co., \$5.50.....	55¢
Cook's, N. H. Copper Co. \$5.00.....	50¢&10¢
Ives' Circular Lip.....	60¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, set 3/4 quaters, No. 5, \$5; No. 30, \$3.50.....	20¢
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢&10¢
Pugh's Black.....	20¢
Car Bits.....	50¢&10¢
L. Hommedieu Car Bits.....	15¢&10¢
Forstner Pat. Aug Bits.....	10¢

## Hollow Augers.

Ives'.....	25¢&10¢
French, Swift & Co.....	25¢&10¢
Douglas.....	40¢&10¢
Bonney's Adjustable, \$4.50.....	20¢
Stearns.....	50¢&52¢
Ives' Expansive, each \$4.50.....	20¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢&10¢

## Expansive Bits.

Clark's small, \$18; large, \$26.....	35¢&35¢
Ives' No. 4, \$20.....	40¢
Swan's.....	40¢
Stearns, No. 1, \$26; No. 2, \$22.....	35¢
Stearns' No. 2, \$48.....	20¢

## Gimlet Bits.

Common.....	¢ gross \$2.75; \$3.25
Diamond.....	¢ doz \$1.10.....
Bee.....	25¢&25¢
Double Cut, Sheppardson's.....	45¢&45¢
Double Cut, Ot. Valley Mfg. Co.....	30¢&10¢
Double Cut, Hartwell's, \$ gro.....	55¢
Double Cut, Douglas.....	40¢&10¢
Double Cut, Ives.....	60¢&60¢

## Bit Stock Drills.

Morse Twist Drills.....	50¢&10¢
Standard.....	50¢&10¢
Cleveland.....	50¢&10¢
Syracuse, for metal.....	50¢&10¢
Syracuse, for wood (wood list).....	30¢&30¢
Williams or Holt's, for metal.....	50¢&10¢
Williams or Holt's, for wood.....	40¢&10¢

## Ship Augers and Bits.

L'Hommiedieu's.....	15¢&10¢
Watrous.....	15¢&10¢
Snell's.....	15¢&10¢
Snell's Ship Auger Pat'n Car Bits.....	15¢&10¢

## Awl Hafts.

Sewing, Brass Fer. \$ gr, \$3.50.....	45¢&10¢
Pat. Sewing, Short, \$1.00 \$ doz.....	40¢&10¢
Pat. Sewing, Long.....	¢ doz \$1.20
Pat. Peg, Plain Top, \$ gr \$10.00.....	45¢&10¢
Pat. Peg, Leather Top, \$ gr \$12.00.....	45¢&10¢

## Awls, Brad Sets, &c.

Awls, Sewing, Common, \$ gr \$1.70, 35¢	
Awls, Should. Peg, \$ gr \$2.45, 40¢&40¢	
Awls, Pat. Peg, \$ gr 63¢.....	40¢&40¢
Awls, Shouldered Brad, 2.70 \$ gr.....	35¢
Awls, Handled Brad, \$7.50 \$ gr.....	45¢
Awls, Handled Scratch \$ gr, \$7.50.....	55¢&10¢
Awls, Socket Scratch, \$ doz, \$1.50.....	25¢&30¢

## Awl and Tool Sets.

Alken's Sets, Awls and Tools, No. 20, \$ doz \$10.00.....	55¢&10¢
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9.....	25¢&25¢
Miller's Falls Adj. Tool Hds., No. 1, \$12; 2, \$18.....	25¢
Henry's Combination Haft.....	¢ doz \$6.50
Brad Sets, No. 42, \$10.50; No. 43, \$12.50.....	70¢&10¢
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$6.50.....	30¢&1¢

## Axes.

<b>Makers' and Special Brands.</b>	
First quality.....	¢ doz \$6.00; \$6.50
Others.....	¢ doz \$5.50; \$5.75

## Axle Grease.

Fraser's.....	Keg \$ 4¢, Pail \$ 5¢
Fraser's, in boxes.....	¢ gr \$9.50
Dixon's Everlasting, in bxs.....	¢ doz 12
Dixon's Everlasting.....	\$1.20; 2 b \$2.00
Dixon's Everlasting.....	10 b pails, ea. \$7.00
Lower grades, special brands.....	¢ gr \$5.50; \$6.00

## Axles.

No. 1.....	4¢&4¢, No. 2 5¢&5¢
No. 1 to 14.....	55¢&5¢
No. 15 to 18.....	47¢&5¢
No. 19 to 22.....	70¢
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5).....	33¢&5¢
Less than 10 sets.....	33¢&5¢
Over 10 sets.....	33¢&5¢

## Bag Holders.

Sprengle's Pat.....	¢ doz \$18.....
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## Balances.

Spring Balances.....	50¢
Common 24 b.....	¢ doz \$1.50.....
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells.

### Hand.

Light Brass.....	70¢&10¢
Extra Heavy.....	60¢&10¢
White Metal.....	60¢&10¢
Silver Chime.....	33¢&10¢
Globe (Cone's Patent).....	25¢&10¢

### Door.

Gong, Abbe's.....	33¢&10¢
Gong, Yankee.....	45¢&10¢
Gong, Barton's.....	40¢&10¢
Crank, Taylor's.....	25¢&10¢
Crank, Brooks'.....	50¢&10¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢&10¢
Lever, Sargent's.....	60¢&10¢
Lever, Taylor's Bronzed or Plated, net.....	25¢&10¢
Lever, Taylor's Japanned.....	25¢&10¢
Lever, R. E. M. Co's.....	50¢&10¢
Pull, Brook's.....	50¢&10¢
Pull, Western.....	25¢&10¢

## Common Wrought.

Common Wrought.....	60¢&10¢
Western.....	20¢&10¢
Western, Sargent's list.....	70¢&10¢
Kentucky, "Star".....	20¢&10¢
Kentucky, Sargent's list.....	70¢&10¢
Dodge, Genuine Kentucky.....	70¢&10¢
Texas Star.....	50¢&10¢
Farm Bell.....	40¢&40¢
Steel Alloy Church and School Bells.....	40¢

## Bellows.

Blacksmiths'.....	50¢&10¢
Molders.....	40¢&40¢
Hand Bellows.....	40¢&10¢

## Belting, Rubber.

Common Standard.....	70¢&10¢
Standard.....	70¢&70¢
Extra.....	60¢&50¢
N. Y. B. & P. Co. Carbon.....	60¢&10¢
N. Y. B. & P. Co. Diamond.....	50¢&10¢

## Bench Stops.

Morrill's.....	¢ doz \$9, 50¢
Hotchkiss'.....	¢ doz \$5, 10¢&10¢
Weston's, No. 1, \$10; No. 2, \$9.25.....	10¢&10¢
McGill's.....	¢ doz \$3.....

## Bits.

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders.

Extension, Barber's, \$ doz \$15.00.....	40¢&40¢
Ives, \$ doz \$20.00.....	60¢&50¢
Diagonal.....	¢ doz \$24.00, 40¢
Angular.....	¢ doz \$24.00, 40¢&5¢

## Blind Adjusters.

Domestic.....	¢ doz \$3.00, 33¢
Excelsior.....	¢ doz \$10.00.....
Washburn's Self-Locking.....	20¢&20¢

## Blind Fasteners.

Mackrell's, \$ doz, \$1.00.....	20¢&20¢
Van Sand's Screw Pat., \$15 \$ gr.....	60¢&10¢
Van Sand's Old Pat., \$15.00 \$ gr.....	55¢&10¢
Washburn's Old Pattern.....	\$9.00 \$ gr net
Merriman's.....	new list, net
Austin & Eddy No. 2008.....	\$9.00 \$ gr net
Security Gravity.....	\$9.00 \$ gr net

## Blind Staples.

Barbed, 1/2 in. and larger.....	¢ doz 7 1/2¢ net
Barbed, 3/4 in.....	¢ doz 8 1/2¢ net

## Blocks.

Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

## Bolts.

<b>Door and Shutter.</b>	
Cast Iron Barrel, Square, &c.....	70¢&70¢
Cast Iron Shutter Bolts.....	70¢&70¢
Cast Iron Chain (Sargent's list).....	65¢&10¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢&70¢
Wrought Square.....	70¢&70¢
Wrt Shutter, all Iron, Stanley's.....	60¢&10¢
Wrt Shutter, Brass Knob.....	40¢&10¢
Wrt Shutter, Sargent's list.....	60¢&10¢
Wrt Sunk Flush, Sargent's list.....	55¢&10¢
Wrt Sunk Flush, Stanley's list.....	50¢&10¢
Wrt B.K. Flush, Com'n.....	55¢&10¢

## Carriage, Machine, &c.

Com. list June 10, '84.....	75¢&10¢
Genuine Eagle, list Oct., '84.....	75¢&10¢
Phila. pattern, list Oct. 7, '84.....	75¢&10¢
R.B. & W., old list.....	75¢&10¢
Machine, according to size.....	75¢&10¢
Bolt Ends, according to size.....	75¢&10¢

## Tire.

Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company: Empire, list Feb. 28, '83.....	70¢
Phila., list Oct. '84.....	82¢
Keystone, Philadel., list Oct. '84.....	80¢
Norway, Phila., list Oct. '84.....	75¢&10¢
American Screw Company: Norway, Phil., list Oct. 16, '84.....	75¢&10¢
Eagle, Phil., list Oct. 16, '84.....	80¢
Phila., list Oct. 16, '84.....	82¢
Bay State, list Feb. 28, '83.....	70¢
R.B. & W., Philadel., list Oct. 16, '84.....	82¢

## Stove and Plow.

Stove.....	65¢
P. & W. Plow.....	60¢&5¢
R. & W. Plow.....	55¢

## Berax.

Without.....	¢ doz \$10¢
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## Boring Machines.

Without.....	¢ doz \$10¢
Augers, Upright, Angular.....	50¢
Douglas.....	\$5.50 \$ doz 50¢
Snell's, Rice's Pat. 5.50.....	8.75, 40¢&10¢
Jennings.....	5.50 8.75, 45¢&10¢
Other Machines.....	2.35 2.75 net
Phillips' Patent with Augers.....	7.00 7.50 net

## Bow Pins.

Humason, Beckley & Co's.....	60¢&10¢
Sargent & Co's.....	\$17 and \$18 60¢&10¢
Peck, Stow & W. Co.....	50¢&10¢

## Braces.

Barber's.	
Nos. 10 to 16.....	50¢
Nos. 30 to 33.....	50¢
Nos. 40 to 63.....	50¢10¢
Barker's.	
Nos. 8, 10 and 12.....	75¢10¢80¢
Plated, Nos. 8, 10 and 12.....	55¢10¢70¢
Osgood's Ratchet.....	108¢10¢50¢
Spofford's.....	50¢50¢10¢
H. H. Green Novelty.....	70¢70¢25¢
New Haven Ratchet.....	60¢25¢60¢10¢
Barber Ratchet.....	60¢25¢60¢10¢
Barbers.....	60¢25¢
Spofford.....	60¢25¢60¢10¢
C. B. Ball, American.....	\$1.10¢\$1.15
Batholomew's.	
Nos. 25, 27 and 30.....	50¢10¢80¢25¢
Nos. 117, 118, 119.....	70¢70¢25¢
Amidon's.	
Barker's Imp'd Plain.....	75¢10¢80¢
Barker's Imp. Nickle'd.....	55¢10¢70¢
Ratchet.....	75¢10¢80¢
Eclipse Ratchet.....	60¢
Globe Jaw'd.....	40¢40¢10¢
Corner Brace.....	40¢40¢10¢
Upwards 8 in., \$2.10; 10 in.....	3.00
Burr's Ball.....	\$1.10¢\$1.15
P. S. & W.....	50¢10¢



**Cards—**

Horse & Curry.....10&10@10&10%  
Cotton.....10@10&10%  
Wool.....10@10&10%

**Carpet Stretchers—**

Cast Steel, Polished.....\$ doz \$2.25  
Cast Iron, Steel Points.....\$ doz 80¢  
Socket.....\$ doz \$1.75  
Bullard's.....25@25&10%

**Carpet Sweepers—**

Bissell No. 5.....\$ doz \$17.00  
Bissell No. 7 New Drop Pan.....\$ doz \$19.00  
Bissell, Grand.....\$ doz \$36.00  
Grand Rapids.....\$ doz \$24.00  
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00  
Magic.....\$ doz \$15.00  
Jewel.....\$ doz \$17.00  
Improved Parlor Queen, Nickle.....\$ doz \$27.00

Improved Parlor Queen, Japanned.....\$ doz \$24.00

Excelsior.....\$ doz \$22.00

Garland.....\$ doz \$18.00

Parlor Queen.....\$ doz \$24.00

Housewife's Delight.....\$ doz \$16.00

Queen.....\$ doz \$18.00

Queen, with band.....\$ doz \$30.00

King.....\$ doz \$18.00

Weed, Improved.....\$ doz \$16.00

Hub.....\$ doz \$16.00

Cog-Wheel.....\$ doz \$22.00

Conqueror.....\$ doz \$22.00

Easy.....\$ doz \$22.00

Monarch.....\$ doz \$22.00

Goshen.....\$ doz \$21.00

Advance.....\$ doz \$18.00

Ladies' Friend, No. 1, \$ doz, \$15.00; No. 2, \$ doz, \$16.00; American.....\$ doz \$15.00

Grand Republic.....\$ doz \$35.00

**Cartridges—**

See Ammunition.

**Casters—**

Bed.....\$ doz \$5.50

Plate.....\$ doz \$5.50

Shallow Socket.....\$ doz \$5.50

Deep Socket.....\$ doz \$5.50

Yale Casters, list May, 1884.....\$ doz \$5.50

Yale, Gem.....\$ doz \$5.50

Martin's Patent (Phoenix).....\$ doz \$5.50

Payson's Anti-friction.....\$ doz \$5.50

Giant Truck Casters.....\$ doz \$5.50

Stationary Truck Casters.....\$ doz \$5.50

Socket Truck Casters.....\$ doz \$5.50

**Cattle Leaders—**

Humason, Beckley & Co.'s.....\$ doz \$7.00

Sargent's.....\$ doz \$6.00

Hotchkiss.....\$ doz \$6.00

Peck, Stow & W. Co.....\$ doz \$6.00

**Chain—**

Trace, 6 1/2-10-2, exact.....\$ doz \$1.03

Trace, 6 1/2-10-3, exact.....\$ doz \$1.03

Trace, 6 1/2-10-4, exact.....\$ doz \$1.03

Trace, 7-10-2, exact.....\$ doz \$1.11

NOTE.—Traces, "Regular" sizes, 3¢ net

Log, Fifth, Stretcher, and other fancy

Chains, list Nov. 1, 1884.....\$ doz \$1.11

American Coll. in cask lots.....\$ doz \$1.11

3-16 1/2 5-16 3/4 7-16 4/8 3/4 3/4

8-16 5/8 5-16 5/8 4-16 3/4 3/4 3/4

Less than cask lots, add 1/4¢ per lb.

German Coll. list of June 20, 1887.....\$ doz \$1.11

German Halter Chain, list of June 20, 1887.....\$ doz \$1.11

Covert Halter, Hitching and Breast.....\$ doz \$1.11

Covert Traces.....\$ doz \$1.11

Onelida Halter Chain.....\$ doz \$1.11

Galvanized Pump Chain.....\$ doz \$1.11

Jack Chain, Iron.....\$ doz \$1.11

Jack Chain, Brass.....\$ doz \$1.11

**Chalk—**

White.....\$ doz \$5.00

Red.....\$ doz \$5.00

Blue.....\$ doz \$5.00

See also Crayons.

**Chalk Lines—**

See Lines.

**Chisels—**

Socket Framing and Firmer.

P. S. & W.....\$ doz \$7.50

New Haven.....\$ doz \$7.50

Wetherby.....\$ doz \$7.50

Mix.....\$ doz \$7.50

Ohio Tool Co.....\$ doz \$7.50

Douglas.....\$ doz \$7.50

Buck Bros.....\$ doz \$7.50

Merrill.....\$ doz \$7.50

L. & I. J. White.....\$ doz \$7.50

**Tanged and Miscellaneous.**

Tanged Filmmers.....\$ doz \$4.00

Spears & Jackson's.....\$ doz \$4.00

Buck Bros.....\$ doz \$4.00

Cold Chisels, \$ doz.....\$ doz \$4.00

**Chucks—**

Beach Pat.....\$ doz \$8.00

Morse's Adjustable, each, \$7.00, 20@20&5%

Danbury.....\$ doz \$6.00, 30@30&5%

Syracuse, Balz Pat.....\$ doz \$6.00, 30@30&5%

**Clamps—**

R. I. Tool Co.'s Wrought Iron.....\$ doz \$2.50

Adjustable, Gray's.....\$ doz \$2.50

Adjustable, Lambert's.....\$ doz \$2.50

Adjustable, Snow's.....\$ doz \$2.50

Adjustable, Hammers.....\$ doz \$2.50

Adjustable, Stearn's.....\$ doz \$2.50

Stearn's Adjustable Cabinet and Cor-

ner.....\$ doz \$2.50

Cabinet, Sargent's.....\$ doz \$2.50

Carriage Makers, Sargent's.....\$ doz \$2.50

Eberhard Mfg. Co.....\$ doz \$2.50

Warner's.....\$ doz \$2.50

Saw Clamps, see Vises

**Clips—**

Norway, Axle, 1/4 & 5/16.....\$ doz \$5.50

2nd grade Norway Axle, 1/4 & 5/16.....\$ doz \$5.50

Superior Axle Clips.....\$ doz \$5.50

Syracuse.....\$ doz \$5.50

Cleveland.....\$ doz \$5.50

Williams.....\$ doz \$5.50

New Process.....\$ doz \$5.50

Drill Bits, See Augers and Bits.

Twist Drills—

Morse.....\$ doz \$5.50

Standard.....\$ doz \$5.50

Syracuse.....\$ doz \$5.50

Cleveland.....\$ doz \$5.50

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Standard.....\$ doz \$5.50

Syracuse.....\$ doz \$5.50



Cross-Cut Saw Handles—	
Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.	
Boydton's Loop Saw Handles, 50¢.	60¢
Champion.....	15¢
Hangers—	
Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England, 60¢10¢10¢70¢	
Samson Steel Anti-Friction.....	55¢
Orleans Steel.....	55¢
Hickton Wrought Wood Track.....	55¢
U. S. Wood Track.....	55¢
Champion.....	60¢10¢
Rider and Wooster, Medina Vfg. Co.'s list.....	70¢
Climax Anti-Friction.....	60¢
Climax Anti-Friction for Wood Track.....	55¢
Zenith for Wood Track.....	55¢
Reed's Steel.....	50¢
Challenge, Barn Door.....	50¢
Sterling's Imp'vd (Anti-Friction).....	55¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	50¢2¢
Chertree.....	50¢10¢
Kidder's.....	50¢10¢60¢
The Boss.....	50¢10¢
Best Anti-Friction.....	50¢10¢
Duplex (Wood Track).....	60¢10¢5¢
Terry's Pat., 7 doz pr. 4 in. \$10.00; 5 in. \$12.00.....	50¢5¢50¢10¢
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.....	50¢15¢50¢
Wood Track Iron Clad, 7 ft. 10¢.....	11¢50¢
Carrier Steel Anti-Friction.....	50¢5¢50¢
Architect, 7 set \$6.00.....	20¢
Elipse.....	20¢10¢
Felix, 7 set \$4.50.....	20¢
Richards.....	30¢50¢10¢
Lane's Steel Anti-Friction.....	40¢10¢
Ball Bearing Door Hanger.....	20¢10¢50¢10¢
Warner's Pat.....	20¢50¢10¢
Stearns' Anti-Friction.....	20¢50¢10¢
Stearns' Challenge.....	25¢10¢25¢10¢10¢
Faultless.....	40¢50¢5¢
American, 7 set \$6.00.....	20¢10¢
Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Paragon, Nos. 5, 5½, 7 and 8.....	20¢10¢
Crescent.....	60¢50¢10¢
Nickel, Cast Iron.....	50¢
Nickel, Malleable Iron and Steel.....	40¢
Seranton Anti-Friction Single Strap.....	35¢45¢
Seranton Anti-Friction Double Strap.....	40¢
Universal Anti-Friction.....	40¢
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....	45¢
Star.....	40¢10¢40¢10¢5¢
May.....	50¢5¢50¢10¢
Barry, \$6.00.....	40¢10¢
Harness Snaps—	
See Snaps.....	
Hatchets—	
List Jan. 1, 1886.....	
Isaiah Blood.....	35¢40¢
Hunt's Shingling, Lath and Claw.....	40¢5¢
Hunt's Broad.....	40¢
Buffalo Hammer Co.....	40¢10¢50¢
Hurd's.....	40¢10¢50¢
Fayette R. Plumb.....	40¢10¢50¢
Wm. Mann, Jr., & Co.....	50¢50¢5¢
Underhill Edge Tool Co.....	40¢50¢50¢10¢
Edwards, Haines and Bright.....	35¢45¢
C. Hammond & Son.....	40¢10¢50¢
Stimmons'.....	40¢10¢50¢
Peck's.....	40¢10¢40¢10¢5¢
Kelly's.....	50¢50¢50¢
Sargent & Co.....	50¢
Ten Eyck Edge Tool Co.....	40¢10¢40¢10¢5¢
Collins.....	10¢
Schulte, Lohoff & Co.....	5 ¢ 50¢5¢
Hay and Straw Knives—	
Lightning, Mfrs. price 7 doz \$18.00, 25¢ But jobbers frequently give extras.....	
Gem.....	7 doz \$10
Wadsworth's.....	40¢75¢50¢10¢
Carter's Needle.....	7 doz \$11.50¢\$12.00
Heath's.....	7 doz \$13.50¢\$14.00
Auburn Hay, Com. and Spear Point.....	50¢
Auburn, Straw.....	40¢
Nolin's Hay.....	7 doz \$10.00
Hinges—	
Wrought Iron Hinges	
Strap and T.....	75¢5¢75¢10¢
Screw Hook and Strap.....	6 to 12 in., 7 ¢ 34¢
Strap.....	14 to 20 in., 7 ¢ 34¢
Heavy Welded Hook.....	6 to 12 in., 7 ¢ 34¢
Hook.....	14 to 20 in., 7 ¢ 34¢
Screw Hook and Eye.....	14 in., 7 ¢ \$1.50
Roller Blind Hinges, Nos. 32 and 34.....	50¢10¢
Roller Blind Hinges, Nos. 232 and 234.....	55¢10¢
Roller Plate.....	70¢10¢
Roller Raised.....	70¢10¢
Plate Hinges (8, 10 & 12 in., 7 ¢ 5¢ "Providence" over 12 in., 7 ¢ 4¢	
Spring Hinges	
Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co.'s list, March, 1886.....	20¢
Acme and U. S.....	30¢
Empire and Crown.....	20¢
Hero and Monarch.....	50¢
American, Gem, and Star, Japaned.....	20¢
American, Gem, and Star, Bronzed.....	20¢
Oxford, Bronze and Brass.....	20¢
Barker's Double Acting.....	20¢10¢
Union Mfg. Co.....	25¢
Bommer's.....	30¢
Eckman's.....	15¢20¢
Chicago.....	30¢
Wiles.....	10¢
Devore's.....	40¢
Rex.....	40¢
Royal.....	60¢
Reliable.....	60¢
Champion.....	60¢
Gate Hinges—	
Western.....	7 doz \$4.40, 60¢
N. E.....	7 doz \$7.00, 55¢
N. E. Reversible.....	7 doz \$5.20, 55¢10¢
Clark's, Nos. 1, 2, 3.....	60¢10¢5¢
N. Y. State.....	7 doz \$5.00, 55¢10¢
Automatic.....	7 doz \$12.50, 50¢
Common Sense.....	7 doz \$4.50, 50¢
Seymour's.....	45¢10¢
Shepard's.....	60¢10¢5¢
Reed's Latch and Hinges.....	7 doz \$12.00, 50¢
Blind Hinges—	
Parker.....	75¢2¢
Palmer.....	50¢5¢10¢
Seymour.....	70¢2¢
Nicholson.....	45¢10¢
Huffer.....	50¢
Clark's, Nos. 1, 3, 5, 40 and 50.....	75¢10¢50¢
Clark's Mortise Gravity.....	75¢10¢50¢
Sargent's, Nos. 1, 3, 5, 11, 13.....	75¢10¢75¢10¢5¢
Sargent's, No. 12.....	75¢10¢75¢10¢5¢
Reading's Gravity.....	75¢10¢75¢10¢5¢
Shepard's.....	75¢10¢5¢
Noiseless.....	75¢10¢5¢
Niagara.....	80¢2¢
Buffalo.....	80¢5¢
Clark's Genuine Pat.....	80¢5¢
O. S., Lull & Porter.....	75¢10¢
Acme, Lull & Porter.....	75¢10¢
Queen City Reversible.....	75¢10¢
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....	75¢10¢2¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....	25¢2¢
Hoes—	
Handled—	
Garden, Mortar, &c.....	65¢
Planter's, Cotton, &c.....	65¢
Warren Hoe.....	60¢
Magic.....	7 doz \$4.00
Eye—	
D. & H. Scovill.....	20¢
Lane's Crescent Planters Pattern.....	45¢5¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢5¢
Sandusky Tool Co., S. & O. Pat.....	60¢
Hubbard & Co., S. & O. Pat.....	60¢
Chattanooga Tool Co., S. & O. Pat.....	60¢60¢10¢
Grub.....	60¢60¢10¢
Hog Rings and Ringers—	
Hill's Improved Ringers.....	7 doz \$4.25
Hill's Old Style Ringers.....	7 doz \$2.75
Hill's Tongue.....	7 doz \$4.50
Hill's Rings.....	7 doz bxs \$2.15¢\$2.25
Perfect Ringers.....	7 doz bxs \$1.60¢\$1.70
Blair's Hog Ringers.....	7 doz \$2.15¢\$2.25
Blair's Hog Rings.....	7 doz \$0.90¢\$1.00
Champion Ringers, Double.....	7 doz \$2.25
Brown's Ringers.....	7 doz \$2.00
Brown's Rings.....	7 doz \$1.25¢\$1.30
Holisting Apparatus—	
Moore's Hand Hoist, with Lock Brake.....	20¢
Moore's Differential Pulley Block.....	40¢
Energy Mfg. Co.'s.....	25¢
Holders, File and Tool—	
Bals Pat.....	7 doz \$4.40; 25¢
Nicholson File Holders.....	20¢
Hollow-Ware—	
Iron—	
Stove Hollow-Ware—	
Ungrind.....	60¢60¢5¢
Enameled Hollow-Ware.....	60¢10¢60¢10¢10¢
Maslin Kettles.....	40¢5¢
Boilers and Saucepans.....	40¢5¢
Tinned Boilers and Saucepans.....	40¢
Gray Enameled-Ware.....	50¢50¢5¢
Maslin Kettles.....	60¢10¢60¢10¢10¢
Boilers and Saucepans.....	40¢5¢
Agate and Granite Ware, old list.....	25¢
Rustless Hollow-Ware.....	50¢50¢5¢
Galvanized Tea-Kettles.....	
Inch.....	6 7 8 5 9
Each.....	55¢ 60¢ 65¢ 75¢
Silver Plated—	
4 mo. or 5 ¢ cash in 30 days.....	
Reed & Barton.....	40¢5¢
Meriden Britannia Co.....	40¢5¢
Simpson, Hall, Miller & Co.....	40¢5¢
Rogers & Brother.....	40¢5¢
Hartford Silver Plate Co.....	40¢5¢
William Rogers Mfg. Co.....	40¢5¢
Hooks—	
Cast Iron—	
Bird Cage, Sargent's list.....	60¢10¢10¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢10¢
Clothes Line, Reading.....	60¢10¢10¢
Ceiling, Sargent's list.....	55¢10¢10¢
Harness, Reading list.....	55¢10¢55¢10¢10¢
Coat and Hat, Sargent's list.....	55¢10¢60¢10¢
Coat and Hat, Reading.....	50¢10¢50¢10¢10¢
Wrought Iron—	
Cotton.....	7 doz \$1.25
Cotton Pat. (N.Y. Mallet & Handle Wks.).....	7 doz \$1.25
Tassel and Picture (T. & S. Mfg. Co.).....	50¢
Wrought Staples, Hooks, &c.....	See Wrought Goods.
Wire—	
Wire Coat and Hat, Gem, list April, 1886.....	45¢
Wire Coat and Hat, Miles, list April, 1886.....	45¢
Indestructible Coat and Hat.....	45¢
Wire Coat and Hat, Standard.....	45¢
Belt.....	75¢10¢80¢
Miscellaneous	
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.....	7 doz \$2.25
Nolin's Grass.....	7 doz \$2.25
Bush.....	50¢60¢
Whiffletree—Patent.....	55¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	60¢10¢10¢
Fish Hooks, American.....	60¢
Bench Hooks.....	See Bench Stops.
Horse Nails—	
Nos. 6 7 8 9 10.....	
Ausable.....	28¢ 26¢ 25¢ 24¢ 23¢
Clinton, Fin.....	25¢10¢25¢10¢10¢
Essex.....	28¢ 26¢ 25¢ 24¢ 23¢
Lyra.....	25¢ 23¢ 22¢ 21¢ 20¢
Snowden.....	25¢ 23¢ 22¢ 21¢ 20¢
Putnam.....	23¢21¢ 20¢ 19¢ 18¢
Vulcan.....	23¢ 21¢ 20¢ 19¢ 18¢
Northwest.....	23¢ 21¢ 20¢ 19¢ 18¢
Globe.....	23¢ 21¢ 20¢ 19¢ 18¢
Boston.....	23¢ 21¢ 20¢ 19¢ 18¢
A. C.....	25¢ 23¢ 22¢ 21¢ 20¢
C. B. K.....	25¢ 23¢ 22¢ 21¢ 20¢
Champlain.....	28¢ 26¢ 25¢ 24¢ 23¢
New Haven.....	28¢ 26¢ 25¢ 24¢ 23¢
Saranac.....	23¢ 21¢ 20¢ 19¢ 18¢
Champion.....	25¢ 23¢ 22¢ 21¢ 20¢
Capewell.....	28¢ 26¢ 25¢ 24¢ 23¢
Star.....	23¢ 21¢ 20¢ 19¢ 18¢
Anchor.....	23¢ 21¢ 20¢ 19¢ 18¢
Western.....	23¢ 21¢ 20¢ 19¢ 18¢
Empire Bronzed.....	14 ¢ 1 ¢
Horse Shoes—See Shoes Horse.	
Hose, Rubber—	
Competition.....	75¢10¢75¢10¢5¢
Standard.....	70¢70¢10¢
Extra.....	60¢60¢10¢
N. Y. B. & P. Co., Para.....	30¢10¢
N. Y. B. & P. Co., Extra.....	50¢
N. Y. B. & P. Co., Dundee.....	60¢10¢5¢
Huskers—	
Blair's Adjustable.....	7 gr \$8.00
Blair's Adjustable Clipper.....	7 gr 7.00
Indurated Fiber-Ware.	
Spittoons, No. 2, 7 doz.....	\$3.75
Basins, Ringed, 7 doz, No. 1, \$3.70; No. 2, \$3.10; No. 3, \$2.70.....	
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 7 doz nests.....	\$16.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 7 doz nests.....	\$8.37
Butter Bowls, 15, 17 and 19-inch (3 pieces), 7 doz nests.....	\$6.75
Liquid Measures, pt., qt., 2 qt. and gallon (4 pieces), 7 set.....	\$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), 7 set.....	\$2.25
See also Putts.....	
Jack Screws—See Screws.	
Kettles—	
Spun. Stamped.	
Brass, 7 to 17 in., 7 doz.....	24¢ 21¢
Brass larger than 17 in., 7 doz.....	26¢ 23½¢
Enameled and Tea Kettles.....	See Hollow-Ware.
Keys—	
Lock Ass'n list Dec. 30, 1886.....	50¢10¢
Eagle, Cabinet, &c.....	60¢5¢
Hotchkiss' Brass Blanks.....	35¢45¢
Hotchkiss, Copper and Tinned.....	40¢
Hotchkiss' Pad, and Cab.....	35¢
Hatchet Bed Keys.....	7 doz \$4.00, 15¢
Wollensak Tinned.....	50¢10¢
Knife Sharpeners—	
Parkin's.....	
Applewood Handles.....	7 doz \$6.00, 40¢
Rosewood or Cocobolo.....	7 doz \$9.00, 40¢
Knives—	
Wilson's Butcher Knives.....	25¢30¢
Ames' Butcher Knives.....	25¢
Foster Bros' Butcher, &c.....	40¢
Nichols' Butcher Knives.....	40¢10¢
Ames' Shoe Knives.....	20¢25¢
Ames' Bread Knives.....	7 doz \$1.50, 10¢30¢
Moran's Shoe and Bread.....	20¢
Hay and Straw.....	See Hay Knives.
Table and Pocket.....	See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.....	\$2.00
Corn, Auburn Mfg. Co. Crescent.....	\$3.50
Knobs—	
Door Mineral.....	65¢68¢
Door Por. Jap'd.....	75¢78¢
Door Por. Nickel.....	\$3.00¢\$2.25
Door Por. Plated, Nickel.....	\$2.00¢\$2.25
Drawer, Porcelain.....	60¢10¢60¢10¢10¢
Hemlock Door Knobs.....	40¢10¢50¢
Yale & Towne Wood, list Dec. 1886.....	40¢
Furniture Plain.....	75¢ gro 10¢
Furniture Wood Screws.....	25¢10¢
Base, Rubber Tip.....	70¢10¢5¢
Picture, Judd's.....	60¢10¢10¢70¢
Picture, Sargent's.....	70¢10¢
Picture, Hemlock.....	35¢5¢
Shutter, Porcelain.....	65¢10¢
Carriage, Jap.....	7 gro 50¢, 60¢10¢
Ladles—	
Melting, Sargent's.....	55¢10¢
Melting, Reading.....	35¢10¢
Melting, Monroe's Pat.....	7 doz \$4.00, 40¢
Melting, F. S. & W.....	35¢10¢40¢
Melting, Warner's.....	80¢
Lawn Mowers—	
Standard List.....	50¢10¢
Quaker City.....	60¢10¢
Enterprise.....	60¢10¢
Lanterns—	
Tubular	
Plain with Guards, 7 doz.....	\$4.00¢\$4.25
Lift Wire, with Guards.....	\$4.50¢\$4.75
Square Plain, with Guards.....	\$4.00¢\$4.25
Sq. Lift Wire, with Guards.....	\$4.25¢\$4.50
Without Guards, 25¢ 7 doz less.....	
Miscellaneous	
Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75.....	20¢25¢
Lemon Squeezers—	
Porcelain Lined, No. 1.....	7 doz \$6.00, 25¢30¢
Wood, No. 2.....	7 doz \$3.00, 35¢
Wood, Common.....	7 doz \$1.70¢\$1.75
Dunlap's Improved.....	7 doz \$3.75, 20¢
Sammis, No. 1, \$5.00; No. 2, \$6; No. 3, \$7.....	18 ¢ 1 ¢
Jennings' Star.....	7 doz \$2.50
The Boss.....	7 doz \$2.50
Dean's, Nos. 1, 7 doz \$6.50; 2, \$3.35; 3, \$1.90.....	
Little Giant.....	50¢50¢5¢
King.....	40¢5¢
Lines—	
Cotton and Linen Fish, Draper's.....	50¢
Draper's Chalk.....	80¢
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25;	

**Molasses Gates—**

Stebbin's Pat. 70¢ 70¢ 71¢  
 Stebbin's Genuine 60¢ 10¢ 10¢  
 Stebbin's Tinned Ends 40¢ 10¢  
 Chase's Hard Metal 50¢ 10¢  
 Bush's 30¢  
 Lincoln's Pattern 70¢ 70¢ 10¢  
 Weed's 30¢ 10¢  
 Boss, 5 doz:  
 Nos. 1, 7; No. 2, 8; No. 3, 9; No. 4, 10.  
 60¢ 10¢ 10¢

Money Drawers 5 doz, \$18.00  
 Muzzles—  
 Safety 5 doz, \$3.00, 25¢

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87  
 Wire Nails, Standard Penny 70¢ 10¢  
 Wire Nails, Standard Penny 70¢ 10¢  
 Nail Puller—  
 Curries Hammer 5 doz, \$9.00  
 Giant, No. 1 5 doz, \$30.00, 10¢  
 Polican 5 doz, \$9.00, 25¢  
 Boss 5 doz, \$30.00, 30¢  
 Lightning 5 doz, \$21.00

**Nail Puller—**

Curries Hammer 5 doz, \$9.00  
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 Polican 5 doz, \$9.00, 25¢  
 Boss 5 doz, \$30.00, 30¢  
 Lightning 5 doz, \$21.00

**Nail Sets—**

Square 5 gr, \$4.00 @ \$4.25  
 Round 5 gr, \$3.25  
 Cannon's Diamond Point 5 gr, \$12.25

**Nut Crackers—**

Table (H. & B. Mfg. Co.) 40¢  
 Blake's Pattern 5 doz, \$2.00, 10¢  
 Turner & Seymour Mfg. Co. 50¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square, Hex.  
 Hot Pressed 5.4¢ 5.9¢  
 Cold Punched 5.4¢ 5.9¢  
 In lots less than 100 lb, 5¢ lb, add 1/4¢; 1-lb boxes, add 1¢ to list.

**Oakum—**

Government 5 lb 7¢ @ 8¢  
 U. S. Navy 5 lb 5¢ @ 6¢  
 Navy 5 lb 5¢ @ 6¢

**Oilers—**

Zinc and Tin 65¢ 65¢ 10¢  
 Brass and Copper 50¢ 10¢ 10¢ 5¢  
 Malleable, Hammers Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 5 doz.  
 10¢ 10¢ 10¢  
 Malleable, Hammers, Old Pattern, same list  
 Prior's Pat. or "Paragon" Zinc 60¢ 10¢ 10¢  
 Prior's Pat. or "Paragon" Brass 50¢  
 Olmstead's Tin and Zinc 60¢  
 Olmstead's Brass and Copper 60¢  
 Broughton's Zinc 60¢  
 Broughton's Brass 50¢

**Packing, Steam—**

Rubber—  
 Standard 60¢ 10¢ 60¢ 10¢ 10¢  
 Extra 60¢ 10¢ 60¢  
 N. Y. B. & P. Co., Standard 60¢ 10¢ 60¢  
 N. Y. B. & P. Co., Empire 70¢  
 N. Y. B. & P. Co., Salamander 70¢  
 Jenkins' Standard 5 lb 6¢, 30¢  
 5 lb 8¢, 35¢

**Miscellaneous—**

American Packing 10¢ 11¢ 5¢  
 Russia Packing 14¢ 5¢  
 Italian Packing 13¢ 14¢ 5¢  
 Cotton Packing 15¢ 17¢ 5¢  
 Jute 7¢ 8¢ 5¢

**Padlocks—**

See Locks.

**Pails—**

Galvanized Iron—  
 Quarts 10 12 14  
 Hill's Light Weight 5 doz, \$2.75 3.00 3.25  
 Hill's Heavy Weight 5 ds. 3.00 3.25 3.75  
 Whiting's 2.75 3.00 3.25  
 Sidney Shephard & Co. 2.80 3.00 3.40  
 Iron Clad 2.75 3.00 3.25  
 Fire Buckets 2.75 3.25 3.50  
 Buckets, see Well Buckets.

**Indurated Fibre Ware—**

Star Pail, 12 qt 5 doz, \$4.50  
 Fire, Stable and Milk, 14 qt 5 doz, \$5.85

**Pencils—**

Faber's Carpenters' high list 50¢  
 Faber's Round Gilt 50¢  
 Dixon's Lead 50¢  
 Dixon's Lead 50¢  
 Dixon's Lead 50¢  
 Dixon's Carpenters' 40¢ 10¢

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;  
 6 to 7, \$13.00. 60¢ 5¢ 60¢ 10¢

**Picture Nails—**

Brass Head, Sargent's list 50¢ 10¢ 10¢  
 Brass Head, Combination list 50¢ 10¢ 10¢  
 Porcelain Head, Sargent's list 50¢ 10¢ 10¢  
 Porcelain Head, Combination list 40¢ 10¢  
 Niles' Patent 40¢

**Pinking Irons—**

5 doz 65¢ net

**Pipe, Wrought Iron—**

List March 23, 1887.  
 1 1/2 and under, Plain 55¢  
 1 1/2 and under, Galvanized 57 1/2¢  
 1 1/2 and over, Plain 57 1/2¢  
 1 1/2 and over, Galvanized 58 1/2¢  
 Boiler Tubes, Iron.  
 1 1/2 and under 57 1/2¢  
 2 in. to 2 1/2 in. 62 1/2¢  
 3 in. and larger 66¢

**Planes and Plane Irons—**

Wood Planes—  
 Molding 50¢ 5¢ 50¢ 10¢  
 Bench, First Quality 60¢ 50¢ 5¢  
 Bench, Second Quality 60¢ 10¢ 60¢ 10¢ 10¢  
 Bailey's (Stanley R. & L. Co.) 40¢ 10¢  
 Iron Planes—  
 Bailey's (Stanley R. & L. Co.) 40¢ 10¢  
 Miscellaneous Planes (Stanley R. & L. Co.) 20¢ 10¢  
 Victor Planes (Stanley R. & L. Co.) 20¢ 10¢  
 Steer's Iron Planes 35¢ 35¢ 5¢  
 Meriden Mal. Iron Co.'s 30¢ 10¢ 30¢ 10¢ 10¢  
 Davis's Iron Planes 30¢ 10¢ 30¢ 10¢ 10¢  
 Birmingham Plane Co. 50¢ 50¢ 5¢  
 Gage Tool Co.'s Self-Setting 20¢ 10¢  
 Chaplin's Iron Planes 40¢ 40¢ 5¢  
 Sargent's 30¢ 10¢ 30¢ 10¢ 10¢

**Plane Irons—**

Plane Irons, Butcher's 50¢ 10¢  
 Plane Irons, Buck Bros 30¢  
 Plane Irons, Auburn Tool Co., "This-  
 tie" 40¢  
 Sandusky Tool Co.:  
 Single and Cut 80¢  
 Double 40¢  
 L. & I. J. White 25¢  
 Pliers and Nippers—  
 Button's Patent 30¢ 10¢ 40¢  
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 5 doz.  
 30¢ 10¢ 30¢ 10¢  
 Humason & Beckley Mfg. Co. 50¢ 50¢ 10¢  
 Gas Pliers 60¢  
 Gas Pliers, Custer's Nickel Plated 60¢ 5¢  
 Eureka Pliers and Nippers 40¢  
 Russell's Parallel 25¢  
 P. S. & W. Cast Steel 50¢  
 P. S. & W. Tinner's Cutting Nippers 50¢  
 Carew's Pat. Wire Cutters 30¢  
 Morrill's Parallel, 5 doz, \$12.00. 30¢ 5¢  
 Cronk's 8 in., \$15.00; 10 in. \$21.00. 40¢ 40¢ 5¢

**Plumbs and Levels—**

Regular List 70¢ 10¢ 70¢ 10¢ 10¢  
 Disston's 45¢ 10¢  
 Pocket Levels 70¢ 10¢ 70¢ 10¢ 10¢  
 Davis Iron Levels 30¢  
 Davis' Inclometers 10¢ 10¢  
 Polish Metal.  
 Prestoline 20¢ 10¢  
 Kestonline Paste 35¢ 4¢  
 Gaston's Silver Compound 35¢ 4¢  
 Pokes, Animal—  
 Bishop's I. X. L. 5 doz, \$6.50  
 Bishop's O. K. 5 doz, \$5.50  
 Bishop's Pioneer 5 doz, \$3.75  
 Bishop's American 5 doz, \$3.00

**Peppers, Corn—**

Round or Square, 1 qt. 5 gr, \$12.00 @ 15.00  
 Round or Square, 2 qt. 5 gr, \$25.00 @ 26.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger, 5 doz, \$36.00.  
 Fletcher Post Hole Augers, 5 doz, \$38.25  
 Eureka Diggers 5 doz, \$16.00 @ 17.00  
 Lead's 5 doz, \$8.00 @ 9.00  
 Vaughan's Post Hole Auger, 5 doz, \$13.00 @ 14.00  
 Kohler's Little Giant 5 doz, \$18.00  
 Kohler's New Champion 5 doz, \$20.00  
 Schneidler 5 doz, \$18.00  
 Ryan's Post Hole Diggers 5 doz, \$24.00  
 Cronk's Post Bars, 5 doz, \$80.00  
 Gibbs Post Hole Digger, 5 doz, \$30.00, 50¢  
 Imperial, 5 doz, \$15.00 45¢  
 Potato Parers—  
 White Mountain 5 doz, \$5.00 @ 5.50  
 Antrim Combination 5 doz, \$8.00  
 Hooster 5 doz, \$13.50

**Pruning Hooks and Shears—**

Disston's Combined Pruning Hook and Saw 5 doz, \$18.00, 20¢ 10¢  
 Disston's Pruning Hook, 5 doz, \$12.00.  
 E. S. Lee & Co.'s Pruning Tools 40¢  
 Pruning Shears, Henry's Pat. 5 doz, \$13.00  
 Kohler's New Champion 5 doz, \$20.00  
 Henry's Pruning Shears, 5 doz, \$4.25 @ 4.50 net  
 Wheeler, M. & C. Co.'s Combination, 5 doz, \$12.00, 20¢  
 Dunlap's Saw and Chisel, 5 doz, \$8.50, 30¢  
 J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

**Pulleys—**

Hot House, Awning, &c. 60¢ 10¢  
 Japanned Screw 60¢ 10¢  
 Brass Screw 60¢ 10¢  
 Japanned Slide 60¢ 10¢  
 Japanned Clothes Line 60¢ 10¢  
 Empire Sash Pulley 50¢ 60¢  
 Moore's Sash, Anti-Friction 50¢  
 Hay Fork, Solid Eye, 4.00; Swivel, 4.50.  
 50¢ 10¢ 50¢ 10¢ 5¢  
 Hay Fork, "Anti-Friction," 6 in. Solid, \$5.70 50¢  
 Hay Fork, "F" Common and Pat. 20¢  
 Hay Fork, Tarbox Pat. Iron 20¢  
 Hay Fork, Reed's Self-Lubricating 60¢  
 Shade Rack 45¢  
 Tackle Blocks. See Blocks  
 Moore's Anti-Friction 5 in. Wheel, 5 doz, \$12.00 40¢

**Pumps—**

Cistern, Best Makers 50¢ 10¢ 60¢  
 Pitcher Spout, Best Makers 60¢ 10¢ 60¢  
 Pitcher Spout, Cheaper Goods 70¢ 5¢  
 70¢ 10¢ 5¢

**Punches—**

Saddlers' or Drive, good, 5 doz, 60¢ 65¢  
 Bemis & Call Co.'s Cast Steel Drive, 60¢ 5¢  
 Bemis & Call Co.'s Springfield Socket, 50¢ 5¢  
 Spring, good quality 5 doz, \$2.50 @ 2.60  
 Spring, Leach's Pat. 15¢  
 Bemis & Call Co.'s Spring and Check, 40¢  
 Solid Tinner's 5 doz, \$1.44, 55¢  
 Tinner's Hollow Punches 20¢ 25¢  
 Rice Hand Punches 15¢  
 Avery's Revolving 30¢ 10¢  
 Avery's Saw-Set and Punch. See Saw Sets.

**Rail—**

Sliding Door, Wrt Brass, 5 lb 35¢ 15¢  
 Sliding Door, Bronzed Wrt Iron, 5 lb, 7¢  
 Sliding Door, Iron, Painted, 5 foot 4¢, 40¢  
 Barn Door, Light In. 5¢ 5¢  
 Per 100 feet \$2.00 2.50 3.10, 10¢  
 R. D. for N. E. Hangers—  
 Small Med. Large.  
 Per 100 feet \$2.15 2.70 3.25, net  
 Terry's Wrought Iron, 5 foot, 44¢ @ 45¢  
 Carrier Track Rail, 7¢ 5 foot, 50¢ 25¢  
 Carrier Steel Rail, 5 foot, 41¢  
 Moore's Wrought Iron 25¢

**Rakes—**

Cast Steel, Association goods 65¢  
 Cast Steel, outside goods 60¢ 10¢ 70¢  
 Malleable 70¢ 70¢ 5¢  
 Gibbs Lawn Rake 12.00, 50¢ 15¢  
 Canton Lawn Rake 9.00, 50¢ 10¢  
 Ft. Madison Prize Bow Brace and Peerless 65¢  
 Fort Madison Steel Tooth Lawn Rake 60.00 25¢

**Razors—**

J. R. Torrey Razor Co. 20¢  
 Wostenholme and Butcher, \$10.00 to 2.10¢

**Razor Stroaps—**

Genuine Emerson 60¢ 60¢ 5¢  
 Imitation 50¢ 20¢ 10¢ 5¢  
 Torrey's 20¢  
 Badger's Belt and Com. 5 doz, \$2.00  
 Lamont Combination 5 doz, \$4.00

**Rivets and Burrs—**

Copper 50¢  
 Iron, list Nov. 17, '87 50¢

**Rivet Sets—**

50¢ 10¢

**Rods—**

Stair, Brass 25¢ 25¢  
 Stair, Black Walnut 5 doz, 40¢

**Rollers—**

Barn Door, Sargent's list 60¢ 10¢ 10¢  
 Acme Moore's Anti-Friction 55¢  
 Union Barn Door Roller 70¢

**Rope—**

Manufacturers' prices for large lots:  
 Manila 1/4 in. and larger 15¢ 15¢  
 Manila 3/8 in. 15¢ 15¢  
 Manila 1/2 in. 15¢ 15¢  
 Manila 5/8 in. 15¢ 15¢  
 Manila 3/4 in. 15¢ 15¢  
 Manila 7/8 in. 15¢ 15¢  
 Manila 1 in. 15¢ 15¢  
 Manila 1 1/8 in. 15¢ 15¢  
 Manila 1 1/4 in. 15¢ 15¢  
 Manila 1 1/2 in. 15¢ 15¢  
 Manila 1 3/4 in. 15¢ 15¢  
 Manila 2 in. 15¢ 15¢  
 Manila 2 1/4 in. 15¢ 15¢  
 Manila 2 1/2 in. 15¢ 15¢  
 Manila 2 3/4 in. 15¢ 15¢  
 Manila 3 in. 15¢ 15¢  
 Manila 3 1/4 in. 15¢ 15¢  
 Manila 3 1/2 in. 15¢ 15¢  
 Manila 3 3/4 in. 15¢ 15¢  
 Manila 4 in. 15¢ 15¢  
 Manila 4 1/4 in. 15¢ 15¢  
 Manila 4 1/2 in. 15¢ 15¢  
 Manila 4 3/4 in. 15¢ 15¢  
 Manila 5 in. 15¢ 15¢  
 Manila 5 1/4 in. 15¢ 15¢  
 Manila 5 1/2 in. 15¢ 15¢  
 Manila 5 3/4 in. 15¢ 15¢  
 Manila 6 in. 15¢ 15¢  
 Manila 6 1/4 in. 15¢ 15¢  
 Manila 6 1/2 in. 15¢ 15¢  
 Manila 6 3/4 in. 15¢ 15¢  
 Manila 7 in. 15¢ 15¢  
 Manila 7 1/4 in. 15¢ 15¢  
 Manila 7 1/2 in. 15¢ 15¢  
 Manila 7 3/4 in. 15¢ 15¢  
 Manila 8 in. 15¢ 15¢  
 Manila 8 1/4 in. 15¢ 15¢  
 Manila 8 1/2 in. 15¢ 15¢  
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<b>Machine—</b>	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
<b>Bench and Hand—</b>	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	20¢10¢
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	25¢5¢
Bed.....	60¢10¢
Hand Rail, Sargent's.....	70¢10¢75¢
Hand Rail, H. & B. Mfg. Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢25¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢50¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
<b>Scroll Saws—</b>	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers.....	25¢
Barnes' Scroll Saw Blades.....	35¢
<b>Scythe Snaths.....</b>	50¢2¢
<b>Shears—</b>	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning.....	See Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....	20¢37¢
Tinners'.....	30¢2¢
Seymour's, List, Dec. 1881.....	60¢10¢60¢10¢10¢5¢
Heinisch's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinisch's Tailor's Shears.....	35¢45¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢
Diamond Cast Shears.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged.....	40¢
Steel.....	40¢
Chicago Drop Forge & F. Co., Solid.....	70¢
Steel Forged.....	70¢
Clauss Shear Co., Japaned.....	60¢
Clauss Shear Co., Nickel, same list.....	60¢
<b>Sheaves—</b>	
<b>Sliding Door—</b>	
M. W. Co., list July, 1888.....	50¢10¢60¢5¢
R. E., list Dec. 18, 1885.....	50¢20¢
Corbin's list.....	60¢10¢2¢
Patent Roller.....	75¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢2¢
Moore's Anti-Friction.....	60¢
<b>Sliding Shutter—</b>	
R. E. list Dec. 18, 1885.....	60¢10¢2¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
<b>Ship Tools—</b>	
L. & I. J. White.....	20¢5¢
Albertson Mfg. Co.....	25¢
<b>Shoes, Horse, Mule, &amp;c.—</b>	
<b>Horse—</b>	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
<b>Mule—</b>	
Add \$1 per keg to above prices.	
<b>Ox, Wrought—</b>	
Ton lots.....	\$ 9 94
1000 lb lots.....	\$ 9 94
500 lb lots.....	\$ 10 10
<b>Shot—</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 3 bag, 25 lb.....	\$1.16
Drop, 3 bag, 5 lb.....	.29
Buck and Chilled, 3 bag, 25 lb.....	1.41
Buck and Chilled, 3 bag, 5 lb.....	.34
<b>Shovels and Spades—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
NOTE.—Jobbers frequently give 5¢ to 7¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢80¢10¢
Griffith's Solid C. S. R. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢20¢75¢
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Binns & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	20¢20¢75¢
Payne Pettibone & Son, list January, 1886.....	30¢
Remington's (Lowman's) Pat.....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢25¢60¢10¢
<b>Shovels and Tongs—</b>	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
<b>Skins, Thimble—</b>	
Western list.....	75¢25¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	60¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
<b>Sieves—</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barler Flour Sifters.....	\$ gr \$18.00
Electric.....	\$ gr \$21.00
Smith's Adjustable Sifters.....	\$ gr \$22.00
Smith's Adjustable Milk Strainer.....	\$ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	\$ doz \$1.25
<b>Sieves, Wooden Rim—</b>	
Mesh 18, Nested, \$ doz.....	70¢ 90¢
Mesh 20, Nested, \$ doz.....	85¢ \$1.00
Mesh 24, Nested, \$ doz.....	\$1.00 1.10
<b>Slates—</b>	
School, by case.....	40¢
<b>Snaps, Harness, &amp;c.—</b>	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert, new Patent.....	50¢2¢
Covert, New R. E.....	50¢5¢2¢
Covered Spring.....	60¢10¢10¢

<b>Soldering Irons—</b>	
Covert's Adjustable, list Jan. 1, 1886.....	35¢2¢
<b>Spoke Shaves—</b>	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
<b>Spoke Trimmers—</b>	
Bonney's.....	\$ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00.....	\$ doz 55¢10¢
Douglas.....	\$ doz \$9.00, 20¢
<b>Spoons and Forks—</b>	
<b>Tinned Iron—</b>	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	33¢2¢3¢
<b>Silver-Plated—(4 mos. or 5¢ cash 30 days.)</b>	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢60¢
L. Boardman & Son.....	50¢10¢
<b>Miscellaneous</b>	
Holmes & Edwards Silver Co.: No. 67 Mexican Silver.....	50¢10¢
No. 80 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 50 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	50¢10¢
German Silver, Hall & Biron.....	50¢50¢5¢
Nickel Silver.....	50¢50¢10¢5¢ cash
Britannia.....	60¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case lots.....	60¢
<b>Springs—</b>	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
<b>Squares—</b>	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	60¢10¢
Try Square and T Bevels.....	60¢10¢60¢10¢
Diamond's Try Square and T Bevels.....	10¢
Wintbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢5¢
<b>Staples—</b>	
Fence Staples, Galvanized.....	Same price as Brb Wire.
Fence Staples, Plain.....	See Trl. Rep.
<b>Steelyards.....</b>	40¢10¢50¢
<b>Stocks and Dies—</b>	
Blacksmith's.....	30¢5¢30¢10¢
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lighting Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢25¢40¢
<b>Stone—</b>	
Hindostan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢.....	\$ 2 24
Sand Stone.....	\$ 12 24
Washita Stone, Extra.....	\$ 14 15
Washita Stone, No. 1.....	\$ 14 15
Washita Stone, No. 2.....	\$ 10 11
Washita Slips, No. 1, Extra.....	\$ 36 38
Washita Slips, No. 1.....	\$ 24 25
Arkansas Stone, No. 1, 4 to 6 in.....	\$ 1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$ 1.80
Turkey Oil Stone, 4 to 8 in.....	\$ 1.00
Turkey Slips.....	\$ 1.00 to \$1.50
Lake Superior Slips, Chase.....	\$ 1.16
Lake Superior Slips, Chase.....	\$ 31 32
Seneca Stone, Red Paper Brand.....	\$ 18 20
Seneca Stone, High Rounds.....	\$ 2 25
Seneca Stone, Small Whets.....	\$ 2 40
<b>Stove Polish—</b>	
Joseph Dixon's.....	\$ gro \$6.00, 10¢
Gem.....	\$ gro \$4.50, 10¢
Gold Medal.....	\$ gro \$6.00, 25¢
Mirror.....	\$ pro \$6.00, —
Lustro.....	\$ gro \$4.75
Ruby.....	\$ gro \$3.75
Rising Sun, 5 gro lots.....	\$ gro \$5.50
Dixon's Plumbago.....	\$ 10 00
Boydton's Moon Day.....	\$ 13.00
Parlor Fringe Stove Enamel.....	\$ gro \$6.00
Yates' Liquid.....	2 3 5 10 gal.....
Yates Standard Paste Polish, 10-lb cans.....	\$ 15 16
Jet Black.....	\$ gro \$3.50
Japaned.....	\$ gro \$3.50
Firestone.....	\$ gro \$2.50
Diamond O. K. Enamel.....	\$ gro \$19.00
Bonnell's Liquid Stove Polish.....	\$ gro \$9.00
Bonnell's Paste Stove Polish.....	\$ gro \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12 14
Black Jack Water Paste, 5 and 10 lb cans.....	12 14
Nickel Plate Paste.....	\$ gro \$8.00
<b>Tacks, Brads, &amp;c.—</b>	
List, Jan. 2, 1888. (Note.—Some manufacturers are selling Tacks at slightly higher prices than those named):	
American Iron Carpet.....	80¢80¢5¢
Steel Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	75¢75¢10¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢5¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢

<b>Common and Patent Brads, 70¢10¢70¢</b>	
<b>Hungarian Nails.....</b>	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢25¢
Cigar Box Nails.....	50¢10¢50¢10¢25¢
Picture-Frame Points.....	50¢10¢50¢10¢25¢
Looking-Glass Tacks.....	50¢10¢50¢10¢25¢
Leathered Carpet.....	50¢10¢50¢10¢25¢
Brush Tacks.....	50¢10¢50¢10¢25¢
Shoe Finders, list Jan. 2, 1888.....	10¢10¢
<b>Lining and Saddle Nails, list Jan. 1, 1888.....</b>	
Silvered.....	30¢10¢10¢
Japaned.....	20¢10¢10¢
Double-Pointed Tacks.....	50¢10¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	50¢10¢
Steel-Wire Brads, R. & E. Mfg. Co's list.....	50¢10¢
<b>Tap Borers—</b>	
Common and Rind.....	30¢10¢
Ive's Tap Borers.....	33¢25¢
Enterprise Mfg. Co.....	30¢10¢30¢
Clark's.....	33¢25¢
<b>Tapes, Measuring—</b>	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
<b>Thermometers—</b>	
Tin Case.....	80¢80¢10¢
<b>Thimble Skins—See Skins.</b>	
<b>Ties, Bale-Steel</b>	
Standard Wire, list.....	50¢10¢5¢
<b>Tinners' Shears, &amp;c.—</b>	
Shears and Snips (P. S. & W.).....	30¢25¢
Punches, see Punches.	
Snips, J. Mallinson & Co.....	33¢4¢
<b>Tinware—</b>	
Stamped, Japaned and Plated, list Jan. 20, 1887.....	75¢75¢5¢
<b>Tire Benders, Upsetters, &amp;c.—</b>	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
<b>Tobacco Cutters—</b>	
Champion.....	20¢10¢30¢
Wood Bottom.....	\$ doz \$5.00 to \$5.25
All Iron.....	\$ doz \$4.25
Nashua Lock Co's \$ doz, \$18.00 50¢55¢	
Wilson's.....	\$ doz \$24.55 to \$10¢
Sargent's.....	\$ doz \$24.55 to \$10¢
Acme.....	\$ doz \$20.00, 40¢
<b>Transom Lifters—</b>	
Wollensak's: Class 1 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reith's, list Jan. 1, 1887.....	50¢10¢2¢
Bronzed Iron Rods.....	30¢
Brass, Real Bronze or Nickel Plate.....	50¢10¢2¢
Excelsior.....	50¢10¢
Shaw's.....	40¢40¢10¢
Payson's Universal.....	40¢40¢10¢
<b>Traps—</b>	
<b>Game—</b>	
Newhouse.....	35¢40¢5¢
Onelida Pattern.....	70¢70¢5¢
Game, Blake's Patent.....	40¢10¢5¢
<b>Mouse and Rat—</b>	
Mouse Wood, Choker, \$ doz holes, 11¢12¢.....	
Mouse, Round Wire.....	\$ doz \$1.50, 10¢
Mouse, Cage Wire.....	\$ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	\$ dz \$2.50, 15¢
Mouse, "Bonanza".....	\$ gr \$10.00
Mouse Delusion.....	\$ gr \$15.00
Rat, "Decoy".....	\$ gr \$10.00, 10¢
Ideal.....	\$ gr \$10.00
Cyclone.....	\$ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	\$ doz 90¢
In full cases.....	\$ doz 75¢
<b>Trowels—</b>	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Disston's Brk and Plastering, 25¢25¢10¢	
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Grade's Brick.....	25¢
Worral's Brick and Plastering.....	20¢
Garden.....	70¢
<b>Triers—</b>	
Butter and cheese.....	25¢
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co.'s list, '82.....	40¢
<b>Tubes, Boiler—</b>	
See Pipe.	
<b>Twine—</b>	
<b>Flax Twine—</b>	
No. 9, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 29¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 30, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 36, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 24, 1/4 and 1/2 B Balls.....	16¢ 27¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Maion Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1/4 B Balls.....	12¢13¢
3-Ply Hemp, 1/2 B Balls.....	11¢12¢
Cotton Wrapping, 5 Balls to lb.....	15¢16¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool.....	61¢60¢
Paper.....	18¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
<b>Vises—</b>	
Solid Box.....	80¢60¢5¢
Fisher & Norris Double Screw.....	15¢10¢
Stephens'.....	25¢30¢

Parker's.....	20¢25¢
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Miller's Falls.....	40¢40¢10¢
Trenton.....	40¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢5¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	20¢
Saw Filers—	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	33¢45¢10¢33¢45¢10¢10¢
Stearns' Silent Saw Vices.....	33¢45¢
Sargent's.....	60¢10¢
Hopkins.....	\$ doz \$17.50, 10¢
Reading.....	40¢10¢
Wentworth.....	20¢10¢
Combination Hand Vices.....	\$ gr \$42.00
Cowell Hand Vices.....	20¢
Bauer's Pipe Vices.....	10¢
Wagon Boxes—	
Per lb.....	34¢
Wagon Jacks—	
Daisy.....	25¢
Washer Cutters—	
Smith's Pat.....	\$ doz \$12.00, 20¢10¢10¢
Johnson's.....	\$ doz \$11.00, 35¢45¢
Penny's \$ doz Pol. \$14; Jap'd, \$16.00, 55¢	
Appleton's.....	\$ doz \$16.00, 60¢10¢
Bonney's.....	30¢10¢
Washers—	
Size.....	1/4 5-16 3/8 1/2 5/8 3/4 1
Washers.....	7 5 4 3 2 1 1/2 1 1/4 1 1/8 1 1/16
In lots less than 200 lb, \$ lb, add 1/4¢, 5-lb boxes 1¢ to list.	
Wedges—	
Iron.....	\$ 3 3/4
Steel.....	\$ 4 4
Well Buckets, Galvanized—	
Hill's.....	\$ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad.....	\$ doz, 14 qt, \$4.25 to \$4.50
Whiting's Flat Iron Band.....	\$4.25 to \$4.50
Whiting's Wired Top.....	\$ doz \$4.00 to \$4.25
Well Wheels—	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
Wire—	
Iron—	
Market.....	
Br. & Ann., Nos. 0 to 18.....	70¢10¢75¢
Cop'd, Nos. 0 to 18.....	70¢70¢5¢
Br. & Ann., Nos. 0 to 18.....	70¢
Tin'd, Tinned list Nos. 0 to 18.....	67¢4¢
Stone, Br. and Ann'd, Nos. 16 to 18, 72¢4¢	
Bright and Ann'd, Nos. 19 to 26, 72¢4¢	
Br. and Ann'd, Nos. 27 to 36, 75¢10¢5¢	
Tinned.....	70¢70¢10¢
Tinned Broom Wire.....	70¢4¢70¢10¢
Galvanized Fence.....	65¢
Annealed Fence, Nos. 8 and 9.....	75¢
Anneak'd Grape, Nos. 10 to 14.....	75¢
Cop'd Genuine, List Jan. 16, 1884.....	15¢20¢
Copper, List Jan. 16, 1884.....	25¢
Barb Fence.....	See Trade Report
Wire on Spools.....	65¢
Malin's Steel and Tin'd Wire on Spools.....	75¢
Malin's Brass and Cop. Wire on Spools 30¢	
Cast Steel Wire.....	50¢
Stubs' Steel Wire.....	\$6.00 to 2, 30¢
Steel Music Wire, Nos. 12 to 30, 55¢	
Picture Wire.....	New list, 50¢
Barb Wire Safety Guards.....	\$ 1000, \$9.00, 25¢
Wire Clothes Lines, see Lines.	
Wire Cloth, Netting, &c.	
Painted Screen Cloth, good quality.....	\$ 100 sq. ft., \$1.80 @ \$1.90
Galvanized Wire Netting.....	75¢75¢5¢
Wire Goods—	
See Bright Wire Goods.	
Wire Rope—	
List May 1, 1886.....	
Iron.....	80¢
Cast Steel.....	40¢
Wrenches—	
American Adjustable.....	40¢
Baxter's Adjustable "S".....	40¢10¢50¢
Baxter's Diagonal.....	40¢10¢50¢
Coe's "Genuine".....	55¢5¢
Coe's "Mechanics".....	55¢10¢2¢
Girard Standard.....	70¢210¢
Machinists', Sterling Wrench Co. 70¢210¢	
Lamson & Sessions' Engineers'.....	60¢10¢
Lamson & Sessions' Standard.....	70¢210¢
Jones' Pattern, Wrought.....	25¢
Girard Agricultural.....	80¢80¢5¢
Lamson & Sessions' Agric'l.....	
Sterling Wrought.....	
Bemis & Call's.....	
Pat. Combination.....	35¢
Merrick's Pattern.....	35¢
Allen's Pattern.....	35¢
Cylinder or Gas Pipe.....	40¢25¢
No. 3 Pipe.....	40¢10¢
Aiken's Pocket (Bright).....	\$6.00, 50¢10¢
The Favorite Pocket.....	\$ doz \$4.00, 40¢
Webster's Pat. Combination.....	25¢
Boardman's.....	20¢40¢
Always Ready.....	25¢5¢
Aligator.....	50¢
Donohue's Engineer.....	20¢10¢
Acme, Bright.....	60¢23¢
Acme, Nickleled.....	50¢23¢
Walker's.....	55¢23¢
Diamond Steel.....	55¢23¢
Wringers, Clothes—	
List March 11, 1889, 2¢ cash.	
Wrought Goods—	
Staples, Hooks, &c., list Jan. 12, 1886, 80¢2¢@3¢23¢	





# THE IRON AGE

THURSDAY, APRIL 25, 1889.

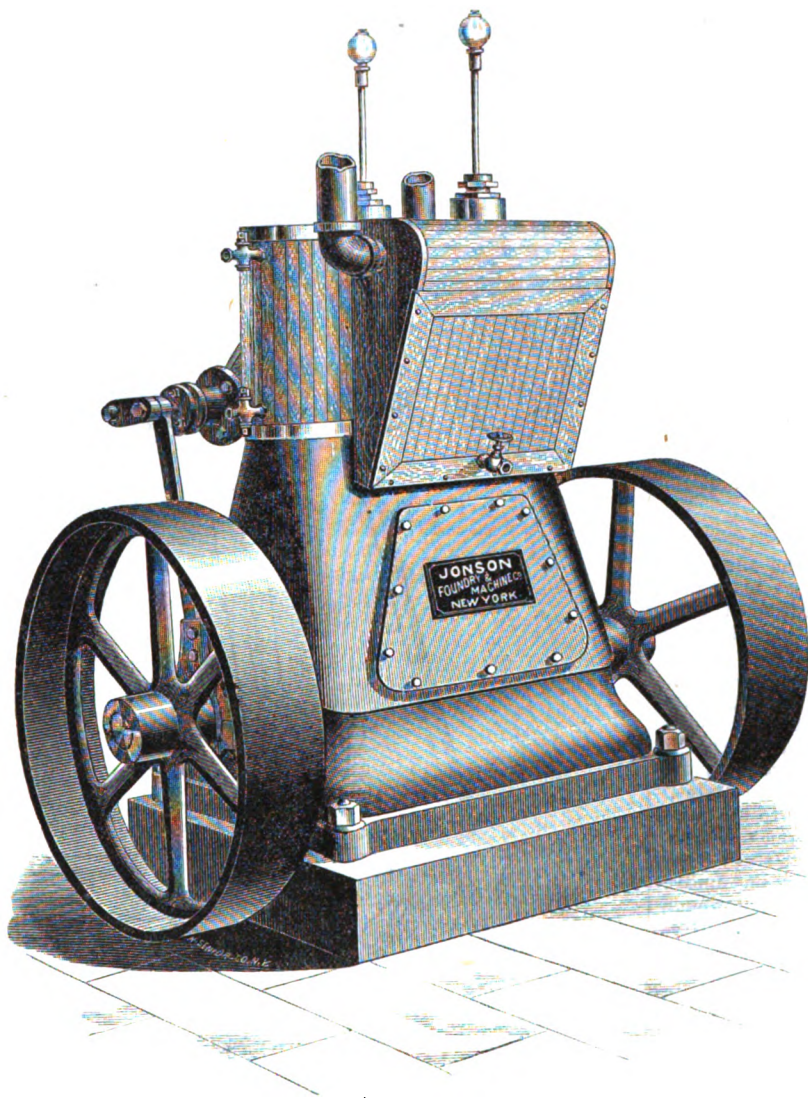
## A New Aluminium Process.

London *Industries* says that "in the course of a discussion upon a paper read by Mr. W. Anderson, before the Society of Arts last week, on the Deville-Castner aluminium process, Mr. Alexander Siemens described a new process invented by Mr. Grabau, who heated fluoride of aluminium in presence of sodium. The melted sodium was poured into the vessel, which was lined with cryolite, and cooled by

the sulphate of sodium and left the aluminium fluoride ready to be reduced. The advantages of this process were that all the materials were treated at a comparatively low temperature, about 900° Celsius. The vessel in which the aluminium fluoride was heated, as well as the vessel in which the reaction took place, was lined with cryolite, so that there was no danger of impurities being incorporated into the aluminium. The low temperature was very much easier managed than the

## Balanced Compound Engine.

The Jonson patent balanced compound engine, of which we herewith present illustrations, is manufactured by the Jonson Foundry and Machine Company, of New York. This engine is of the trunk type and consists virtually of four half cylinders with cranks set opposite or 180°, forming in fact an equivalent for the ordinary high and low-pressure cylinder; the area of the annular space between the trunk and



BALANCED COMPOUND ENGINE, BUILT BY THE JONSON FOUNDRY AND MACHINE COMPANY.

water; and the heated fluoride of aluminium, in the form of powder, was thrown upon the melted sodium. Very violent reaction took place, the heat generated by the reaction being sufficiently great to melt the aluminium as well as the by-product. As soon as the reaction was complete, the whole molten mass could be poured out into suitable forms and the aluminium settled at the bottom and the cryolite at the top. To obtain the fluoride of aluminium Mr. Grabau used the cryolite, which he procured by the final reaction by putting the powdered cryolite into a solution of sulphate of aluminium. The reaction which took place between the sulphate of aluminium and the cryolite gave the aluminium fluoride. The solution was afterward evaporated, and the residue was washed with water, which took out

high temperatures of the Castner process. The Grabau process of course required the action of sodium, and the inventor was engaged in experimenting upon a new process to prepare this. A factory was at work near Hanover producing aluminium on a commercial scale."

The Queen and Crescent Route has issued a circular announcing a change of rates to a number of points, which took effect on the 1st inst. Among them we note Alton, Ill., \$3.70 from Birmingham, and \$3.45 from Chattanooga; Beloit and Janesville, Wis., \$5.25 and \$5; Massillon, Ohio, \$4.35 and \$3.85; Ottumwa, Iowa, \$5.25 and \$5; Rockford, Ill., \$5 and \$4.75; Vandalia, Ill., \$4.25 and \$4, and Wabash, Ind., \$4.15 and \$3.65.

low pressure or compound cylinder being equal to that of the high-pressure cylinder. Thus in the engine in the accompanying cut the compound cylinder being 12½ inches in diameter, the trunk 9½ inches scant; the difference in areas, 122.72—72.72=50, or nearly 8 inches, making this engine 8 x 12½ x 10 inches stroke. Steam is exhausted from the high-pressure end of each cylinder to the upper or compound end of the same cylinder, so that alternately the high-pressure end of one cylinder and its opposite compound one form a complete half stroke.

Except for electric lighting purposes, or for very large sizes where the slide-valves are of great area, the manufacturers make the high-pressure steam and compound valves in the same casting, passing the high-pressure exhaust through

ports in the valve to the low-pressure end, and by giving the steam, compound and exhaust valves a definite lead, as determined by practice, the working of both cylinders in unison is always assured. But the two valves being in the same casting and driven by a single eccentric, or in the case of the marine engine by two eccentrics, and the ordinary link motion, any change in this motion, as in using an automatic cut-off, affects the compound and exhaust as well as the live steam, and it is therefore preferable to use for this purpose an independent steam valve as shown in the cut. On marine engines the ordinary adjustable cut-off is used. Where, as above stated, the valve area is very large the valve is divided. In the case of an engine of 275 horse-power, which the above company are now building for the Government for an iron steam tender, the ordinary piston-valve is used for the live steam and a slide-valve for the compound. The advantages of this type of engine are compactness, freedom from vibration, very low center of gravity, and as all the moving parts are exact reproductions of each other, it is perfectly balanced and can be run at a very high rate of speed, making it especially valuable for electric lighting. The engraving does not show the automatic flywheel governor, as it is not an essential feature of the engine and as it is well understood. When testing this engine it was belted to a dynamo requiring 35 horse-power to run it. No variation could be detected in the speed of the engine when the entire load was instantly thrown on or off by the movement of a switch.

#### The Lead Cables in the Berlin Central Stations.

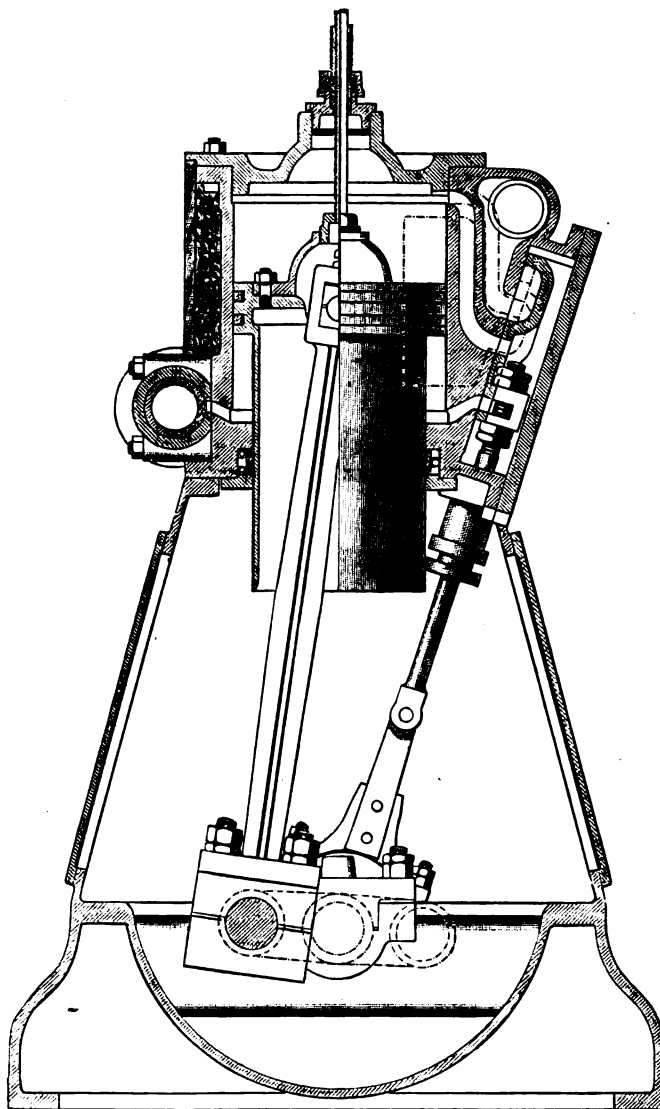
As was to be expected, the announcement which Professor Forbes made at a recent meeting of the Institution of Electrical Engineers in London, regarding the failure of the Berlin cables, has created a strong feeling of indignation among German electricians, and the feeling found vent at the last meeting of the Electro-Technical Society, held in Berlin. On this occasion Dr. Werner Siemens read a paper on "Underground Electric Light Mains," and gave a categorical denial to the statement that lead cables are destroyed by electrolytic action within three years from the time they are first put underground. In the Berlin system of underground mains four failures have occurred, but these have been all due to mechanical injury; and owing to the want of proper supervision, and especially owing to the impossibility of performing frequent tests where the mains of different districts are all coupled together as in Berlin, the faults were not detected in time to prevent failure. Out of the total of 130 km. of lead cables in Berlin, only 200 m. had to be replaced, and now the network of lead cables is again in perfect condition. In other places cables of this kind have been in use for nearly five years, and their insulation now is as perfect as when they were first put down. Dealing with the probable future extension of electric supply, Dr. Werner Siemens gave it as his opinion that in a short time the available space under the streets of large towns will not suffice for the accommodation of the various cables, gas and water pipes and sewers, nor will the surface of the streets suffice for the increased traffic, and he looks forward to the rearrangement of large towns, where there will be streets on two levels. The new streets, either over or under the existing ones, are to be exclusively used for express service with electric tramways, and for the placing of the various conductors for telephony, telegraphy, light and power, gas, water, compressed air and steam. At the same meet-

ing Herr O. von Miller read a paper on the recent extension of the Berlin electric works, which have now a capacity of 4000 horse-power, sufficing for the supply of 50,000 lamps wired. During the present year six new dynamos, representing 4600 horse-power, will be installed, and this will increase the capacity to 100,000 lamps by the end of the year. The buildings are, however, large enough to admit machinery for a capacity of 200,000 lamps.

#### Rusting of Rails in Tunnels.

M. Savioz, chemist of the St. Nazaire works, France, recently completed an interesting series of experiments on the rust-

that the influence of carbon and manganese on the rusting tendency is slight, a variation of carbon of from 0.18 to 1.10 per cent., and of manganese from 0.26 to 1.15 per cent., the proportions of sulphur, phosphorus and silicon remaining the same, showing no appreciable difference in behavior of the samples. With increasing percentage of phosphorus, on the other hand, a decided tendency to oxidation was observed. The small number of tests, however, did not admit of the formulation of any law. The tests showed, further, that samples from the upper ends of the ingots were more readily attacked than those from the lower ends, and that wrought iron, with which also comparisons



VERTICAL SECTION OF JONSON'S BALANCED COMPOUND ENGINE

ing of steel. The method followed consisted in exposing the metal to the action of acid waters, and observing the reduction of weights. The results showed throughout that the proportion of phosphorus present exerted an appreciable influence on the behavior of the metal. Since rails in long tunnels are undoubtedly exposed to the action of dilute sulphuric acid, the phosphorus percentage may be accepted as one of the causes of their rapid oxidation, and Savioz' researches are accordingly noteworthy. The *Organ fuer die Fortschritte des Eisenbahnwesens* publishes two tables giving the results obtained by him. One set of tests was made with Bessemer and Siemens-Martin steel sheets of varying thickness and chemical composition, and the other with test pieces of similar material, two pieces being taken from each ingot, one from the upper and one from the lower end. The figures show

were instituted, was less affected than steel with 0.17 per cent. of phosphorus, but considerably more than steel samples ranging in phosphorus between 0.05 and 0.08 per cent. The tests, we should add, were made with a mixture consisting of one part of hydrochloric acid to five parts of water, and extended over 24 hours each.

It is reported that the present owners of the Shelby Iron Company, the producers of the well-known charcoal iron, at Shelby, Ala., are willing to sell their interest in that remunerative property, at a relatively low price.

The Standard Oil Company have contracted with the Riverside Iron Works, of Wheeling, W. Va., for 25 miles of steel pipe for one of their pipe lines near Warren, Pa.

## The Krupp Works at Essen.

The city of Essen lies northeast of Dusseldorf, and is reached from Brussels by way either of Cologne or Gladbach. It is situated in the fertile basin of the Ruhr, near Duisburg, another manufacturing city. Indeed, Essen is in the center of the great factory district of Westphalia, a veritable hive of industry, in which are also to be found Crefeld, Elberfeld and Dortmund. These are not the only noticeable features of Essen's position, for it lies in one of those fortunate regions in which Nature has stored abundant coal and iron, the very basis of metal working. To the Krupp Works Essen owes its world-wide reputation, and in a great measure all its prosperity. In 1862 its population scarcely reached 1700, but the number of workmen employed in the great foundry increasing from day to day, the little town did not cover sufficient ground to shelter them all, and rapidly expanded. In ten years the population doubled, and to-day, encircled by a belt of attractive suburbs, the old city contains nearly 100,000 people. The impression is at once received that the whole town is more or less dependent upon the works.

From a work recently published, entitled "Krupp and De Bange," we take the following data concerning some of the equipment of the furnace establishment. Though the description is not technically accurate and does not convey any new facts, it is vividly written and is interesting, as it reflects the impressions of one to whom the sights of a large works have not become a familiar matter:

In a part of the gun shop, first entered, the great guns are majestically enthroned; the leviathans of naval armament, the behemoths of coast defense. Man feels his insignificance in the presence of these awe-inspiring engines, yet he is their lord and master. Among all these finished masses of pure steel, at whose sides a horde of mechanics are busy, four especially rivet the attention of the beholder; they are the 40 cent. guns, 14 m. long, and weighing a trifle over 120 tons, say 120,000 kg. And yet but a few years ago the 100-ton iron gun with steel lining, made by Sir William Armstrong for the Duilio, was emphatically announced as the supreme effort in the struggle of ordnance against armor, the final outcome of constructive ability. Here the metal is not iron, but steel entirely, and crucible steel at that. The charge of each crucible is only 40 kg., and the reader can picture to himself the amount of work embodied in each of these pieces in remembering that the casting of each involves the simultaneous pouring of from 1700 to 1800 crucibles, yielding an ingot of 70,000 kg. As each gun consists of tube, mantle and rings, this Titanic operation must be repeated twice for each piece, as the rings alone permit the use of much smaller ingots. The ponderous blocks of steel required for these enormous guns are nevertheless forged and finished with comparative ease, so great is the capacity of Krupp's tools and so daring the intelligence which directs them. These guns were ordered by the Italian Government for the seacoast defense.

### THE CARRIAGE ASSEMBLING SHOP.

We regretfully left this interesting sight to enter another structure, in which are the assembling shops for naval and seacoast carriages. Communicating galleries are built at a height of 10 m. between the shops. From one of these we glanced above us at the traveling cranes of 50,000 and 30,000 kg. capacity, which, at a height of 15 m. and with a span of 22 m., traverse the great shops, lifting and shifting the heaviest masses, working automatically by bell signals. Below us we see in hand a carriage with rotating platform protected

by a sheet-steel cupola. This model is designed for a great ironclad, the pride of modern navies. Other carriages of established model, with hydraulic buffers and shot-cranes, are ready for the cars. Let us go down to get a nearer view of the work of assembling; let us see how the cupola turns on its rollers. Stop, it is moving. "She doesn't work badly," said the foreman, "a little filing here and there and she's all right." Above us the crane advances, goes back with impressive deliberation, making nothing of its huge loads, and, from time to time, the click of gearing and the ringing of a small bell reveal the existence of the train that moves this indispensable apparatus; and everything goes apparently in a routine way, quietly, without excitement or shouting; little is said in the Krupp establishment, but the work goes on all the same. At the four corners of the edifice ponderous lifts are installed, and, taken all in all, we are sure that there could not be a better disposition of the powerful mechanical devices which science has placed in the hands of the constructor. But let us hasten to examine the various processes of steel-making in use here, for the Essen Works turn out Bessemer, open-hearth, puddled and crucible steel.

### THE BESSEMER PLANT.

Bessemer steel is made on a great scale at Essen; 10,000 tons of rails can be made per month. This shows that Krupp is not unwilling to take advantage of scientific progress in whatever direction it tends, and does not disdain to make cheap steel to meet the wants of all railroad interests. But we must make no mistake; he uses the Bessemer process only for making commercial brands. Interested parties have started a rumor that the crucible steel, which alone is used for gun metal, is made in part by remelting Bessemer scrap. We have assured ourselves by watching the charging of crucibles that this rumor is entirely baseless. It would be still more audacious to assert that the converters furnish the ingots required for tubes, mantles or even rings, for we looked in vain for molds at the Bessemer works of sufficient size for the purpose, or for cranes powerful enough to handle the great blocks out of which the gun parts are fashioned. The fact is apparent that the works are especially equipped for the output of the small ingots required in rail fabrication.

### THE OPEN-HEARTH PLANT.

Krupp also makes steel by the Martin-Siemens process, which, besides affording facilities for determining the character of the bath by the drawing of test specimens, yields a more constant and homogeneous product than the Bessemer. It is slower, we must admit, but it is more certain; the carbon point can be so regulated that we can obtain the hardest as well as the softest metal, steel suitable for springs or for boiler plates. The open-hearth plant is extensive and well arranged. The reverberatory furnaces, in which the molten metal simmers under the action of the flame, are arranged in two rows, having between them cranes of medium capacity; under these are the casting pits. Here, as at the Bessemer plant, there is no sign that open-hearth steel is used for gun metal; no deep pits, no gigantic cranes. Not a particle of this steel goes into the crucibles; we assert this without fear of denial, for we have at hand convincing evidence. Open-hearth steel is used at Essen for the fabrication of all kinds of plate, tires, axles and other structural parts; also for all castings, such as car-wheels, crossheads, hydraulic cylinders, and, in general, for all machine members which do not need that absolute homogeneity and exceptional strength demanded by gun metal, and which so especially characterize crucible steel. As we

entered the foundry the work was in full swing; the furnaces flamed with dull crackling, and the crane moved along the great bay, holding suspended the pouring ladle; at intervals, when above the mold, a stream of molten metal gushed out momentarily, as with a lightning flash, making darkness visible, and disappeared in the glowing receptacle. In front of the works numerous castings, just from the molds, were slowly cooling under slag; they were truck-wheels. These castings are not to be trusted, inoffensive as they look; they remain hot for a long time, and those who walk about carelessly are apt to carry away ardent and lasting reminders.

### THE PUDDLED-STEEL PLANT.

It is easily understood that the portion of the establishment devoted to crucible steel making, the metal of which all Krupp guns are constructed, possessed the greatest attraction for us. Besides, with or without reason, all sorts of myths attached themselves to this mysterious metal, and the probabilities are that had the famous gun-maker lived in the dark ages his unlucky competitors would have accused him of witchcraft, and the stake would have effectually disposed of an inconvenient rival. The iron ores used by Krupp in the fabrication of his gun metal are of the very highest grade and of remarkable purity. As a rule, hematite and spathic ores are used, the same ores from which that excellent cast iron, called by Germans *spiegeleisen* and by the French *fonte miroitante*, is made. They come either from the Siegen region or from the firm's mines near Bilbao, in Spain. The iron is delivered at the works in pigs, and makes up the charge of the puddling furnace. The puddling is under control of experienced and tried workmen; indeed, a regular puddling school exists at Essen; no one can become a boss until, after numerous and difficult trials, he has proved himself thoroughly up in all the details of the art. Of course puddled steel is made at Essen upon the same scientific principles as in England, France or Belgium. While science is the same everywhere, each mill has its own special "knack" which characterizes its output. We will go a step beyond, and affirm that were Krupp to establish works in some foreign country, without taking with him his mechanics, his ordnance experts, and his foremen, many of them born within sight of his establishment, most of whom have grown gray in his service, the steel he would there make would be different from that produced to-day at Essen. The determining conditions are indigenous to the soil and dependent upon the generations of workmen evolved under their influence, just as the tree clings by its roots to its mother earth.

Let us, however, return to the iron about to be partially decarburized in the furnace. It is vigorously assailed by the fire, and thoroughly rabbled by the puddler; the excess of carbon is driven off, and the iron becomes steel. The skill of the puddler lies in stopping the operation at the exact moment when the iron comes to nature; if this passes the work is lost. The loop, or ball, as the spongy steel mass is called, is carried on a trolley to the steam hammer, the metal is squeezed under its blows, and slag and other impurities are expelled, the molecules are condensed, arranged, and rammed together, and the ball becomes a billet. This hammered billet is then taken to the rolls, and leaves them as a long, square rod, which is at once hardened in a pool occupying the center of the mill. Each rod, after critical inspection as to quality, is broken into pieces about 20 cm. long, which are sorted accordingly. The toughest and most homogeneous are reserved for gun-metal charges; the others are classed for special



work, such as crankshafts, axles, high-grade tires, &c. The advantage of this procedure is self-evident; the expert can, so to speak, after the crucible charge has been fixed, determine beforehand the strength which the melt will possess, and, as it is worked in small masses, there is the greatest possible chance of securing almost perfect compactness.

The puddling works always present a busy appearance; the steel bubbling in the furnaces is energetically stirred and worked by the rabbles of the puddlers. These are fine fellows, all nerve and muscle, whose perspiring faces, occasionally lighted up by a sudden flash of flame, bear testimony to the hardships of their trade. Here the steam hammers angrily pound the unwilling billets; further along the glowing bars writhe in audible agony through the roll grooves. Add to this the whirring of the pulleys, the clanking of the chains which hold the roll tongs that guide the heavy masses of steel, the calls of the bosses, the chant of the hundred ovens in which iron and coal crackle, the heavy puffing of the steam motors, and you have a picture in ever-varying colors of one of the most magnificent phases of modern industry. Puddled steel, which by the very principle and method of its fabrication is assured great uniformity, is the base of the crucible charge; the rest of the alloy is puddled iron. This is made of special pigs, and worked in the manner just described; it gives tenacity to the compound. It is rather refractory, but the puddled steel, the greater part of the charge, has a comparatively low melting point and a certain flux, one of Krupp's "secrets," is added. We came to the conclusion that charcoal was its main ingredient. The crucible, whose contents weigh exactly 40 kg., is carefully luted, heated in the warming oven and is then exposed to the high temperature of the melting furnace.

#### CRUCIBLE MANUFACTURE.

This is the proper time to speak of the melting pot, the crucible. It is made of a special composition, peculiar to the Krupp Works. We witnessed the manufacture, and came to the conclusion that the mixture consisted mainly of fire-clay with a less proportion of graphite. The material of which the crucible is made exercises a great influence upon the final constitution of the melted contents. Krupp has made this a subject of exhaustive investigation, for the works consume an enormous number of crucibles, as each can be used but once. No further evidence of this is needed than the piles of charged and broken pots stacked in the shop yards. A part of this waste material, however, is utilized; it is ground into powder under huge vertical stones, and is thus rendered fit for use in making new crucibles. New composition and old dust are ground fine, mixed in great vats and thoroughly worked up with the utmost care into a thick, pasty slip. The crucible is now to be molded. Imagine a hollow cast-iron truncated cone, the mold, and a solid metal core of suitable size and similar shape, which fit to just the dimensions of the prescribed crucible. Now fill the mold with the proper quantity of slip and slowly enter the core, the compressed plastic material flows between mold and core and shapes itself; the excess seeks to escape, but is held by a collar and forms the rim. The pot is then taken out of the mold and dried. The works, as already stated, consume daily a very large number of crucibles, for as a rule four crucible casts are made every 24 hours. The drying and storing rooms are in immense four-story edifices with spaced flooring, on which the crucibles stand in long rows. The superintendent of this important branch told us that there were already 100,000 crucibles in store, which are used in succession. We could not verify this

statement, but we are sure that it would have taken us hours, possibly a whole day, to count them.

#### THE CRUCIBLE-STEEL PLANT.

We come now to crucible casting, which in every way is the most singular, the most interesting and the most picturesque work we saw during our whole visit. The foundry stretches out almost interminably, and is furnished with all the apparatus necessary for the successful carrying out of this delicate and difficult work. Upon the extended sides, along the walls, are installed the gas heating ovens; parallel to them in two lines are built the melting ovens flush with the ground, and connected by subterranean galleries for the service of the attendants. The Krupp establishment uses in its crucible-steel plant about 130 coke and 80 gas ovens. Each oven has a capacity of 12 crucibles. Some, however, can hold 18, so that casts of from 1600 to 1800 crucibles, even more if necessary, may be easily undertaken. The largest steel blocks cast at Essen up to the present time weigh 70,000 kg., required in the construction of the 120-ton guns. About 1700 crucible charges were needed in casting them. Along the center line of the structure the casting pits are dug and the movable cranes are located. The process of casting is in itself of absorbing interest; it is a striking illustration of the precision and coolness of the master founder, of the discipline and skill of the workmen.

When the steel in the crucibles has reached the desired melting temperature, after being from four to five hours in the furnace, the master founder places the mold, as near as may be, equidistant from the active ovens. He then sets up the casting runners, heavy sheet-iron channels lined with fire-brick. These runners lead the liquid metal in corruscating streams to the gate which surmounts the mold in which they are engulfed. The foundrymen are dressed in two long lines, facing to the center, and divided into threes and twos. One of each three carries a tong, the others a rod, very much like a brewer's mash ladle. As soon as the master founder has completed his preparations, and upon inspection ascertains that the proper melting point has been reached, he gives the signal, the oven covers slide back and the casting begins. The melter with the tongs clasps the crucible, and resting the curved tong handle upon the rod, held by the other men as a fulcrum, he lifts it out of the oven. Keeping it vertical, the three place it on the ground some distance from the furnace. Then the other two take it, and pour its contents into the runner. The empty pots are thrown in a heap out of the way of the workmen. Group silently follows group; the crucibles shimmer through the foundry in a meteoric shower; the silence is broken only by the clatter of the sliding oven covers and the crackling of the molten streams as they glide in the runners toward the flask, into whose fiery mouth they plunge in a glittering cascade.

#### THE 50-TON HAMMER.

A word about the 50-ton hammer, so long the boast of the Krupp Works. Imagine a square steel head, 3.70 m. long, 1.50 m. wide and 1.25 m. deep, a mass of 7 c.m., hung at a height of 12 feet in an arch 5 m. high, whose supports are 1.50 m. in diameter. Now a steel anvil, resting upon successive foundations of masonry, oak—a whole forest was required—and cast iron; finally, in your mind's eye, put the glowing ingot under the hammer head. The hammer boss, a veteran artist in blue glasses—for it is impossible to watch the incandescent mass with the naked eye—is in direct charge. At his right and left are the men who grasp the chains encircling the monster, and who, at a hand wave, without a word or order, oscillate the block until the desired position is at-

tained. The hammer slowly descends, the head hardly touches the ingot, then, after a rapid inspection, it is quickly raised and comes down with all its might upon the metal, which quivers and gives under its terrible blows. About the hammer the ground trembles as with an earthquake wave. Stop! the hammer rests, the block is turned on its side, the machine takes breath again, like a Colossus raising his club to brain the enemy, and pounds again upon the bruised mass, which finally gives way under this storm of blows; the block is forged.

The 50-ton hammer was built about 20 years ago and cost the small sum of \$500,000, but it must be admitted in excuse that it earns its living honestly and pays good interest on its cost. At that time Creusot had only a 12-ton hammer; however, there are 80 and even 100 ton hammers. "Why," it is asked, "does Krupp suffer himself to be outdone by his rivals?" We must first note that the Essen hammer has really an effective weight of 60 tons, and the heaviest blocks forged weigh, as already mentioned, 70,000 kg. These blocks are bored; the forging can therefore be altogether effective, for the hammer blows need not penetrate to the heart of the block. Further, the monster guns now constructed date back only a few years. Altogether, up to the present, more powerful mechanical contrivances were not required; yet for some time past Krupp has contemplated erecting a hammer of much greater weight, and the matter is so far advanced that within a few months Essen will again surpass its rivals in its ability to forge the very heaviest steel masses. It would hardly be proper for us to say more on this subject. After forging the shapes are subjected to a peculiar annealing process, and are then transferred to the gun-shops for finishing and assembling. We will not dwell upon the other products of the works—steel cast wheels, coil and elliptical springs, tires, &c.—all abounding in interest, and which in themselves justify Krupp's great reputation. We examined the entire plant with sustained interest, but we cannot within the scope of this paper undertake to impart our impressions.

The theory of Dr. F. C. G. Mueller concerning the character of the gas occluded in steel has been confirmed in a striking manner. The inventors of the famous Mannesmann method of making steel tubes, by rolling them excentrically from a solid bar, sent to the Charlottenburg laboratory two tubes closed at both ends, a partly finished product, therefore. The steel contained 0.46 carbon, 0.25 silicon, 0.022 phosphorus, 0.01 sulphur, 0.23 manganese and a trace of copper. The hollow cavity contained 9.11 c. cm. of gas at a pressure of 760 mm. Chemical analysis showed that this gas was composed of 99 per cent. of hydrogen and only 1 per cent. of nitrogen, confirming Mueller's theory that the gas occluded in steel castings is hydrogen.

An important act for the protection of minority stockholders and the securing of publicity in corporate affairs has been passed this month by the Legislature of Massachusetts. Hereafter the officials of every company chartered in that State will be required to file at the State House, on the request of any stockholder, between 30 and 60 days before its annual meeting, complete lists of the shareholders, with their residences and the number of shares belonging to each. These statements are to be made in a form approved by the commissioner of corporations, and are to be sworn to. The penalty for neglect to file the required lists is a fine of \$1000 against the corporation and the same sum on the delinquent official.



**New Punching Press.**

The accompanying engraving represents a new punching press built by E. W. Bliss Company, of Brooklyn, N. Y., intended for use in the manufacture of iron boilers, tanks, smoke-stacks, and other sheet-iron and steel work. With it holes can be

plied for a patent, which was still pending; that his furnace bore the device "Patent applied for," and that the manufacture of the furnace by the defendant was an infringement. In dealing with the case whether an inventor can maintain a bill for an injunction before the issue of a patent, Judge Brown decided adversely,

tion is simple and places the engine under quick control. These engines are made in sizes from  $\frac{1}{4}$  to 20 horse-power.

**The Boiler-Makers' Meeting.**

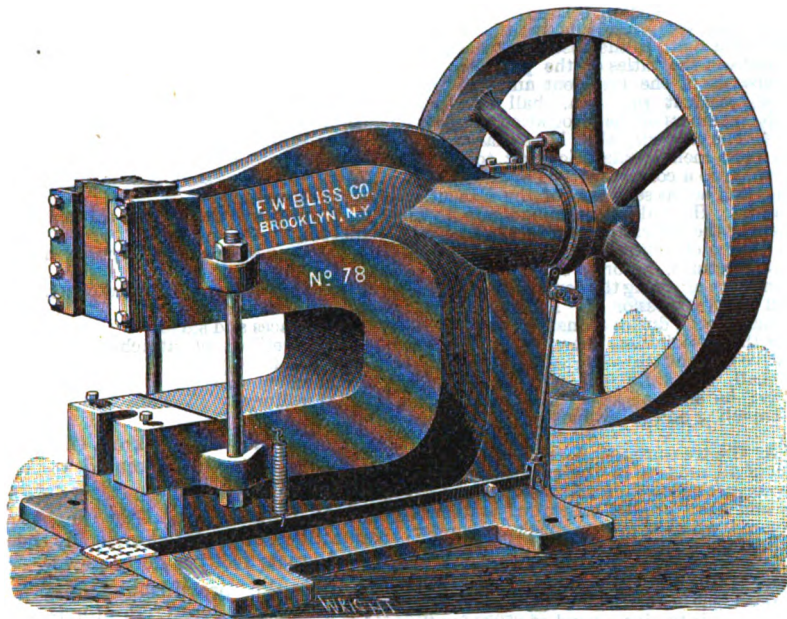
In response to a call issued by A. T. Douthett, secretary of the Porter Foundry and Machine Company, Limited, of Allegheny City, Pa., the boiler manufacturers of the United States met at the Hotel Anderson at 9 o'clock a.m., on Tuesday, the 16th inst., and at once proceeded to organize themselves into an association. James Lappan, of Pittsburgh, was chosen president; A. T. Douthett, of Allegheny, Pa., secretary, and Messrs. Rohan, St. Louis; Marshall, Dayton, Ohio; Cunningham, Brooklyn, N. Y., and Hartley, Philadelphia, Pa., vice-presidents. Committees on organization and resolutions were appointed, consisting of the following members: Messrs. E. D. Meier, J. R. Brownell, R. Hammond and James Barnhill, organization; Philip Rohan, Geo. Marshall, H. J. Hartley, John Over, J. P. Jefferson, R. Monroe and A. T. Douthett, resolutions. After the appointment of these committees the meeting adjourned until 2 o'clock p.m.

The convention upon reassembling in the afternoon received the reports of the committees appointed in the morning. The Committee on Permanent Organization made quite a voluminous report, the substance of which will be given hereafter in the constitution and by-laws. The resolutions drafted by the committee appointed for that purpose made the following report, which was unanimously adopted:

**WHEREAS**, No business calls for greater care, better material in the construction of its commodity and more exact workmanship than ours; and in view of the fact that so many disastrous explosions have occurred in the past where materials afterward tested have been shown to be of an inferior quality; therefore, that we may better secure safety to the lives and the property of every community where boilers are used, be it

**Resolved**, That we will in all cases use the best material in the construction of boilers, refusing to accept contracts where specifications do not call for material of suitable quality.

**Resolved**, That it is the sense of this convention that the system of inspection prescribed by the United States marine laws should be adopted with but few exceptions.



PUNCHING PRESS, MADE BY THE E. W. BLISS COMPANY.

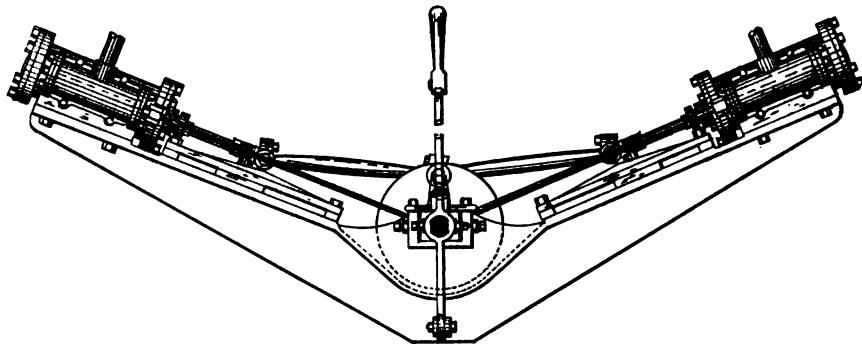
punched in sheets 24 inches from the edge, and when the stay-bolts are used heavy sheets may be punched 7 inches from the edge. The machine is also useful in riveting iron lattice and framework as used in fitting up offices, elevator shafts, &c. The wheel is 54 inches in diameter, weighs 900 pounds, and is locked to the forged steel shaft by a new patented clutching device that is positive in its action and exceedingly powerful. Four locking grooves are provided in the hub of wheel, thus preventing any loss of time in starting, and a friction collar on the shaft insures the stopping of the slide at the top of stroke every time. When made as shown in cut its weight is 4500 pounds, and when geared for heavy work it weighs 5500 pounds.

**"Patent Applied For."**—A practice widely followed is to attach to an article manufactured the words "Patent applied for," with the idea that it protects the invention until a patent is issued. In the United States District Court at Detroit Judge Henry B. Brown has just rendered a decision bearing upon the value of this system. The case in which the question arose was that of Barnard Rein and Asa W. Straight *vs.* Clayton and Lambert. It appears that in August, 1887, Straight went to Clayton, who at one time was employed as foreman of Drury & Taylor, and showed him a burner invented by him for use as a vaporizer on a gasoline stove, to be applied to plumbers' hand furnaces. Clayton made one, which he used for some time. In the spring of 1888 Clayton went into business for himself, and as an adjunct commenced making furnaces for Straight, adding some improvements on it. The exclusive sale of the furnace was given to Lambert & Sons, and as great improvements, in addition to others, suggested themselves to Clayton, he resolved to make a furnace of his own, and in September, 1888, took Lambert & Sons in with him and commenced to make furnaces, having applied for a patent on the same. Straight asked for an injunction to restrain Clayton & Co., alleging that he had already ap-

entering a decree denying the injunction and dismissing the bill for want of jurisdiction.

**Launch Engine.**

The engine of which we herewith present an outline drawing is manufactured by Lombard Bros. & Co., of Boston, the sole agent being John J. Bockée, of 47 Dey street, New York. The bed of the engine is cast in a single piece, the angle being such as to conform as closely as pos-



LAUNCH ENGINE, BUILT BY LOMBARD BROS. & CO.

sible to the sides of the boat. By this construction the shaft is brought to the lowest possible point in line with the keel, while at the same time the bed acts as a brace or stiffener to the boat, thereby increasing its strength at that point where the vibrations and weight make it most needed. The cylinders being arranged at the angle shown in regard to each other, there is no dead-center. The valve eccentric is so connected by feather and spiral groove as to be shifted by the movement of a centrally-placed lever. The engines can be started, reversed and stopped by the movement of this bar, which controls the relative position of the valves. The construc-

**Resolved**, That we recommend all manufacturers of iron and steel boiler plate to make but one brand, which shall have a tensile strength of not less than 55,000 or more than 65,000 pounds to the square inch, and that the same be stamped with the initial letters found in the name of this association—viz., A. B. M. A., and that this brand be sold to the members of the organization only.

**Resolved**, That we use all honorable means in influencing our representatives in Congress to procure the passage of such laws as will make it a criminal offense, punishable by fine and imprisonment, to manufacture or sell iron or steel of an inferior quality for boilers, and a similar offense, punishable in like manner, to make boilers for any purpose of an inferior quality to those specified by such laws.

**Resolved**, That we invite all manufacturers of boilers to join our association, knowing as

we do that our object is purely philanthropic, and that we are bestowing one of the greatest blessings upon the public at large, who should look with distrust upon any manufacturer who, by reason of personal motives, refuses to take this important step.

At the evening session the Committee on Constitution and By-Laws, consisting of Colonel Meier, P. Rohan, Brownell and Bornhorst, presented the following, which was adopted:

Constitution and By-Laws of the American Boiler Manufacturers' Association. Adopted at Pittsburgh, April 16, 1889.

For the purpose of affording means of ready consultation, and of united, intelligent and effective action on matters of mutual interest, the undersigned, American Boiler Manufacturers, hereby associate themselves together and agree to be bound and governed by the following constitution and by-laws:

#### CONSTITUTION.

##### ARTICLE I.

Name.—The name of the association shall be the American Boiler Manufacturers' Association.

##### ARTICLE II.

Its objects are

1st. To establish such standard for materials and workmanship as will insure uniform excellence of construction of all American boilers, and thus secure safety to the lives and property of all communities where boilers are used, and to procure the passage of laws making the manufacture, sale or use of inferior materials criminal offenses.

2d. To concert such measures and take such action as shall be for the interest and advantage of its members, especially,

3d. To procure and furnish to its members statistics of the trade, domestic and foreign, and

4th. To take such action as shall from time to time be deemed advisable regarding the regulation of prices and production.

##### ARTICLE III.

Membership.—Any firm, corporation or individual manufacturing boilers who shall take part in the adoption of this constitution shall hereby become a member of this association, and thereafter any such manufacturer may become a member upon application to his State Committee in writing, agreeing to be bound by this constitution and paying the initiation fee.

##### ARTICLE IV.

Officers.—The officers of this association shall be a president, three vice-presidents, a secretary and a treasurer. These officers shall together constitute an executive committee. The duties of said officers shall be such as usually appertain to their offices, and such as shall be set forth, stated and fixed by the by-laws of this association, or such as may from time to time be imposed upon them by the association.

##### ARTICLE V.

Assessments.—The expenses of this association shall be met by initiation fees and by assessments levied from time to time, as regulated by the by-laws.

##### ARTICLE VI.

State Committees.—Each State in which at least three members of this association are located and in which they employ not less than one hundred (100) boiler-makers shall be entitled to a State Committee of not less than three nor more than five members, who will organize by electing from their number a chairman and a secretary, who shall at once notify the president of the association of such action. Members in such States where there are no State Committees may attach themselves to the nearest State Committee.

##### ARTICLE VII.

All questions affecting the boiler trade or connected with the welfare of this association shall be submitted to the vote of the association by letter ballot through the State Committees by the president on resolution of the Executive Committee. It shall further be the duty of the president to submit such matters in the same manner on the written request of any five members of the association.

##### ARTICLE VIII.

Amendments.—Any changes in our amendment to this constitution may be made at any regular meeting of the association, provided at least one month's notice has previously been given by circular to the members—absent members voting by letter ballot, or by letter ballot after like notice, the ballots being canvassed by a majority of the Executive Committee. A two-thirds vote of the whole association shall be necessary to carry any such change or amendment.

##### BY-LAWS.

Section 1. The officers of the association, after those elected at the time of organization, shall

be elected by ballot at the regular meeting, to be held on the first Tuesday in February of each year, and shall hold their respective offices for one year, or until their successors are elected and are ready to enter upon the duties of their respective offices.

Sec. 2. The president shall preside at all meetings of the association, shall be entitled to vote on all questions coming before the association, and shall perform all other duties incident to the office of president.

Sec. 3. The vice-presidents in the order of their election shall, in the absence of the president, perform the duties of the president, and in the absence of the president and vice-presidents a president *pro tem.* shall be elected from the members of the association present.

Sec. 4. The secretary shall have charge of all papers and a memoranda belonging to the association, keep a correct method of all its proceedings and act as secretary of the Executive Committee. He shall also communicate to all members of the association, through the State Committee, such action and information relative to meetings, reports, statistics, &c., or other matters affecting the common interest as he shall be in possession of. He shall also perform such special duties as may be assigned to him by the association, the president or the Executive Committee. The salary of the secretary shall be \$3000 per annum, payable monthly; he shall also be paid his expenses when traveling on the business of the association.

Sec. 5. The treasurer shall receive and have charge of all moneys of the association, shall keep a correct account of the receipts and expenses and shall present a detailed statement of the same, with the proper vouchers therefor, annually at the meeting in February and whenever called upon by the association. The treasurer will pay out money only to the order of the president countersigned by the secretary. The treasurer is to give a bond of \$5000 for the faithful performance of his duties.

Sec. 6. The initiation fee is to be \$25. The Executive Committee may fix assessments from time to time, not exceeding \$20 in any one year.

Sec. 7. The Executive Committee in the intervals between the meetings of the association shall have the authority to take such action as they may determine upon in furtherance of the general objects, reporting such action to the next meeting of the association, or by circular through the State Committees. They shall also perform such duties as may from time to time be imposed upon them by the association.

Sec. 8. Any vacancy in any office, however occurring, shall be filled by the Executive Committee at their next meeting after the vacancy shall have occurred.

Sec. 9. The meetings of this association shall be held in various parts of the country; the point for each annual meeting to be chosen at the preceding meeting.

Sec. 10. These by-laws may be altered or amended by a simple majority of those voting by letter ballot on one month's previous notice by circular.

Philip Rohan moved that the secretary, or some other person appointed by him and other members of the Executive Committee, receive \$1000 and all expenses while traveling for the period of six months, that all those desiring to join the organization might have an opportunity of knowing its purpose.

Motions to furnish all boiler manufacturers with a report of this convention, that a certificate of membership be given to those joining the association, that the next meeting be held in Pittsburgh, October 15, 1889, that the invitations of Carnegie, Phipps & Co., Park Bro. & Co. and National Tube Works be accepted, were adopted in quick succession.

Just before adjourning Col. E. D. Meier, of St. Louis, Mo., presented the following resolutions, which were unanimously adopted:

Whereas, Thorough uniformity in the construction of boilers can only be attained by a careful consideration of all the elements which together make up the sum of perfect materials and workmanship; and

Whereas, In these important matters the individual knowledge and experience of all members of the A. B. M. A. should be collected, arranged and compared before intelligent discussion and conclusions become possible; therefore, be it

Resolved, That the president shall at each regular meeting appoint committees of from three to five members each, well distributed territorially, whose duties shall be to collect and tabulate these data in the form of reports, to be submitted for discussion at the meeting next following; and that he shall also appoint

such committees in the interim between regular meetings when requested by at least five members to do so, provided, however, that such committees are to have at least three months' time to complete their work; and provided, further, that no standards shall be adopted unless agreed to by a two-thirds vote of the whole association. Every such committee, as soon as organized, shall prepare a circular calculated to draw out from all members their best thought on the subject in hand, which is to be transmitted through the secretary of the association to each member in the manner prescribed by the by-laws, such circular to state the latest date on which replies may be made, and that the committees may, if they see fit, send such circulars also to others versed in these matters; and be it further

Resolved, That the president appoint the following committees:

1. On proper specifications for materials and tests of same.
2. On proper rules for riveting and calking.
3. On proper dimensions and construction of manheads and manholes.
4. On braces and stays.
5. On methods of attachment of valves, gauges and fittings.
6. On safety valves.
7. On uniformity in State boiler inspection laws.

Mr. J. C. McNeil, of Akron, Ohio, moved that a committee be appointed to investigate the tube question.

H. R. Barnhurst, of Erie, moved that a committee be appointed to decide the number of square feet per horse-power.

Among the prominent people present from a distance were I. P. Morris & Co., H. J. Hartley, Philadelphia; Philip Rohan, St. Louis; George Marshall, Dayton, Ohio; Christopher Cunningham, Brooklyn; R. Hammond, Buffalo; J. R. Brownell, Dayton; Col. E. D. Meier, St. Louis; James Barnhill, Bellaire; Novelty Steam Boiler Works, Brooklyn; Heine Safety Boiler Company, St. Louis; James T. Dougherty, Dayton; J. L. Shanks & Co., Salem, Ohio; James F. Wangler, St. Louis; Charles Miller, Beaver Falls; Struthers, Wells & Co., Warren, Pa.; Alonzo L. Cady, Steubenville; Lovegrove & Co., Philadelphia; Wilfong Brothers, Philadelphia; Stearns Mfg. Company, Erie, Pa.; A. R. Barnhurst, Erie; J. C. McNeil & Co., Akron; Farrar & Trefts, Buffalo; John H. Collins, Amsterdam, N. Y.; Tippet & Wood, Phillipsburg, N. J.; G. N. Barnes, Corry, Pa.; Thomas S. Driscoll & Co., Columbus, Ohio; Corry City Iron Works, Corry; Booger Brothers & Co., Columbus; Cleveland Steam Boiler Works, Cleveland; Wm. T. Bate & Son, Conshohocken, Pa.; Cox & Morrison, Wheeling; H. Holdane, Reeves Bros., Niles, Ohio; Charles Heinz, Dayton, Ohio; D. Conley, Cleveland; John Over, Philadelphia; J. P. Jefferson, Warren, Pa.; R. G. Morrison, Sharon; Richard Garstang, St. Louis.

Firms who were unable to be represented, but who have signified by letter their intentions of becoming members, are:

Bartlett, Hayward & Co., Baltimore; Excelsior Iron Works, Chicago; Daniel Kelly, Philadelphia; Geo. E. Tift, Sons & Co., Buffalo; Summit City Boiler Works, Akron, Ohio; Ames Iron Works, New York; Erie City Iron Works, Erie; Jas. Russell & Sons, South Boston, Mass.; Buckeye Engine Company, Salem, Ohio; Henry Worden, Philadelphia; Best Steam Engine and Boiler Works, Lancaster; Porter, Jackson & Co., South Chicago; A. J. Brown, Paterson, N. J.; Hugh Leslie, Jersey City; Geo. Strecker & Co., Marietta, Ohio; Alliance Steam Boiler Works, Alliance, Ohio; Cox & Sons, Bridgeton, N. J.; Frick Company, Waynesboro, Pa.; L. J. Lyons & Co., Newark, N. J.; Middleport Boiler Works, Middleport, Ohio; Gorman & Pettit, Alexandria, Va.; Connery Boiler Company, West Philadelphia; Johnston Bros., Ferrysburg, Mich.; Porter Manufacturing Company, Syracuse, N. Y.; South Bend Boiler Works, South Bend, Ind.; The Bigelow Company, New York City; National Water



Tube Boiler Company, New Brunswick, N. J.; A. B. Farquahr & Co., York, Pa.; The Globe Iron Works Company, Cleveland; Tudor Boiler Manufacturing Company, Cincinnati; Reeves Bros., Niles, Ohio; Armstrong Bros., Springfield, Ohio; Taylor Manufacturing Company, Chambersburg, Pa.

The following are the committees appointed:

Committee on Materials and Tests: E. D. Meier, St. Louis; Richard Hammond, Buffalo; H. J. Hartley, Philadelphia; J. R. Brownell, Dayton, Ohio.

Committee on Proper Rules for Riveting and Calking: Robt. M. Connery, Philadel-

Committee on Uniformity in State Inspection Laws: Geo. Marshall, Dayton, Ohio; Thos. G. Lovegrove, Philadelphia, Pa.; Christopher Cunningham, Brooklyn, N. Y.; G. N. Barnes, Corry, Pa.; Philip Rohan, St. Louis, Mo.

### Sectional Boiler.

The steam generator of which we herewith present an engraving taken from our contemporary *Engineering* is the invention of Charles Ward, of Charleston, W. Va. It consists of 12 vertical pipes arranged in a straight line, six at each side

N. From these it proceeds into the drum L, where the steam is separated by a number of perforated diaphragms on its way to the pipe J. The water descends through the drum and repeats the circuit. The semicircular tubes are connected to the vertical pipes by right and left hand steel bushings, as shown by the detail view. The following are the particulars of this boiler:

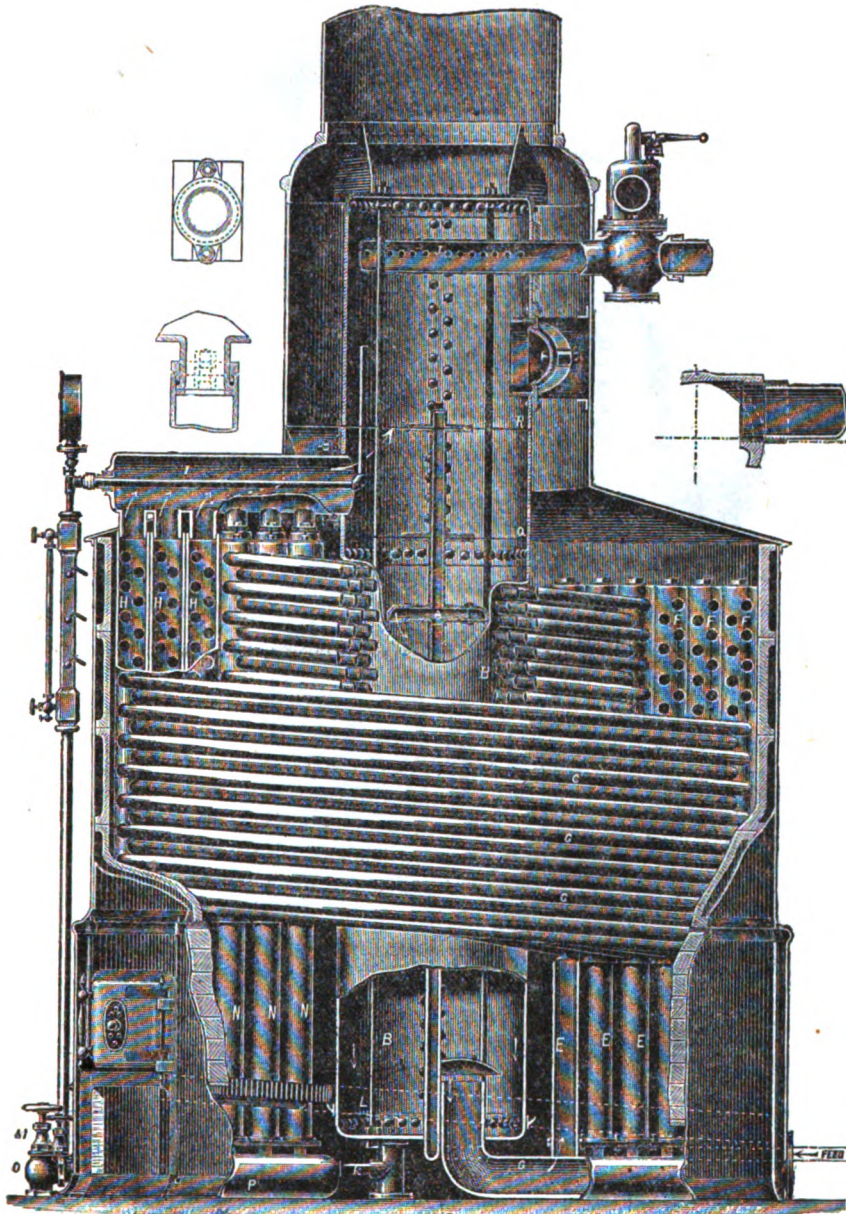
Heating surface.....	1311 square feet.
Grate area.....	42 "
Number of tubes.....	288
Outside diameter of fire-box..	8 feet 7 inches.
Height of casing.....	7 " 3 "
Diameter of drum.....	2 " 4 "
Height.....	10 " 6 "
Total weight of boiler.....	8 tons.

This boiler is made in 15 sizes, varying from 660 square feet of heating surface to 2432 square feet.

### Building and Loan Associations.

Building and loan associations had their origin in Philadelphia, where the earliest one was organized in January, 1831. The majority of those formed at first were unincorporated. A few of them were organized under special acts. A general act authorizing their incorporation was passed in 1850. At first the number of shares was limited, but in 1874 this limit was removed, with the proviso that the aggregate capital of an association should not exceed \$1,000,000. It was estimated by the Secretary of Internal Affairs of Pennsylvania in 1879-80 that the associations in Philadelphia had been the means of making 80,000 people owners of real estate. The number of associations in Pennsylvania at present is estimated at 900, the aggregate capital at \$65,000,000, and the total savings paid into the associations in a year at over \$17,000,000. In New York associations were formed as early as 1849, and a general act authorizing their incorporation was passed in 1851. The first ventures in New York City were unfortunate, and the system died out there after a few years, not to reappear until 1885, since which time there has been a marked revival. A general act providing for their incorporation was passed in 1887. The system has extended to other States, among them being Massachusetts, Ohio, Illinois, Wisconsin, Michigan, Minnesota, Indiana, Iowa, Kansas, Missouri, California, Louisiana and Texas. The total number of these associations in the United States is estimated by Seymour Dexter, in an article published in the *Quarterly Journal of Economics*, at about 4000, the accumulations held by them at about \$300,000,000, and the amount which will be paid in the form of dues during the current year at about \$65,000,000. Touching the economic advantages of these associations, Mr. Dexter says that as an institution for savings no scheme has yet been devised and put into operation which combines safety of the funds, cheapness in management and good rates of interest in so great a degree. Further, he says that these associations can be conducted successfully in any business center having a population of 500, and thereby the benefits of an institution for savings can be secured by the many villages that have not sufficient population to maintain a savings bank, while as a means for stimulating savings such associations are more potent than savings banks themselves, owing to the fact that while a man is a member he is compelled to deposit a certain amount at fixed periods, while he is at liberty to withhold his deposits from the savings banks.

Only a few heats were made on the Bildt process at the Troy Works, nor was the steel produced carried as low as it is possible to go, the carbon contents of the steel ranging between 0.06 and 0.09 per cent.



WARD'S SECTIONAL BOILER.

phia; John MacCormack, Albany; J. Mathews, South Bend, Ind.

Committee on Manheads and Manholes: Jos. F. Wangler, St. Louis; A. Wilfong, Philadelphia; J. S. Shanks, Salem, Ohio; Luther Allen, Cleveland, Ohio; R. Munroe, Pittsburgh, Pa.

Committee on Bracing and Stays and Proper Tube Spacing: J. C. McNeil, Akron, Ohio; J. P. Jefferson, Warren, Pa.; Henry Warden, Philadelphia.

Committee on Attachment of Valves and Fittings: Richard Garstang, St. Louis; Thos. S. Driscoll, Columbus, Ohio; Geo. S. Barnum, New Haven, Conn.

Committee on Safety Valves and Horsepower: H. R. Barnhurst, Erie, Pa.; Chas. F. Foster, St. Louis, Mo.; J. W. Wood, Phillipsburg, N. J.; John Trefts, Buffalo, N. Y.

of a central drum. Each pair of vertical pipes is joined by 48 slightly inclined tubes, each forming nearly a semicircle. There are, therefore, six concentric sections of tubes, two only of which are shown in the illustration. The vertical pipes are joined to large horizontal pipes at the lower ends, and one set of them is connected at the upper end to a horizontal pipe in communication with the central drum. The following is the mode of operation: The feed water is introduced to the central drum by a pipe ending in rose A; it descends slowly, becoming heated in its passage, and deposits its mud at the bottom of the drum. It then enters the horizontal pipe G (called by the inventor a "manifold") and rises up the vertical pipes E until it can escape through the curved tubes G G into the vertical pipes

### The Western Wages Scale.

In a little more than a month the wages scale question will come up before the Western iron manufacturers and the Amalgamated Association of Iron and Steel Workers. The scale now in force pays \$5.50 per ton for boiling on a 2-cent card, and will expire on June 30 next. Considerable interest is already being manifested concerning the question whether the manufacturers will act on their individual responsibility or whether they will appoint a conference committee, as they did last year. Then the manufacturers had an association known as the Association of Manufacturers of Iron, Steel and Nails, the sole object of which was to deal with labor and wages questions. The members composing this organization prepared a scale last year based on \$5 per ton for puddling on a 2-cent card, and it was given out that every member had pledged his word to stand out for the enforcement of this scale. When July came several of the manufacturers at once signed the Amalgamated scale and proceeded to start up their mills. This action caused considerable ill feeling, and charges of bad faith were made, with the result that the manufacturers' organization was broken up and a number of its former members stated that in the future they would act on their own responsibility in settling wages questions. Up to the present time no attempt has been made to reorganize this association, and from present appearances the conference committee of the Amalgamated Association will have to present their scale to the manufacturers individually this year. While it is true there is plenty of time remaining for the manufacturers to organize, it is also true that there are a number who will refuse to join any organization that may be formed. It is the impression that the lack of organization will very materially weaken the position of the manufacturers and give the workmen a decided advantage if a conflict should take place. While nothing definite can be said at this time as to what demands will be made by the parties interested, it is believed that the workmen will present practically the scale now in force, while hints have come from certain quarters that the manufacturers will demand a very material reduction. The question has already been brought up of closing down the mills during the months of July and August, and is being agitated principally by the workmen, who state that a complete shut-down for those months would allow the manufacturers to reduce their stocks and also give the workmen a much-needed rest. Some of the manufacturers view this proposition with favor, while others state that they will not agree to it, for the reason that they would be in danger of losing their trade. It is a well-known fact that there are certain concerns in the West so situated that it is an impossibility for them to close down their plants for a length of time, and these concerns are always among the first to sign the scale rather than submit to a shut-down. The developments of the next few weeks will no doubt throw considerable light on this important question.

### Basic Steel for Horseshoe Nails.

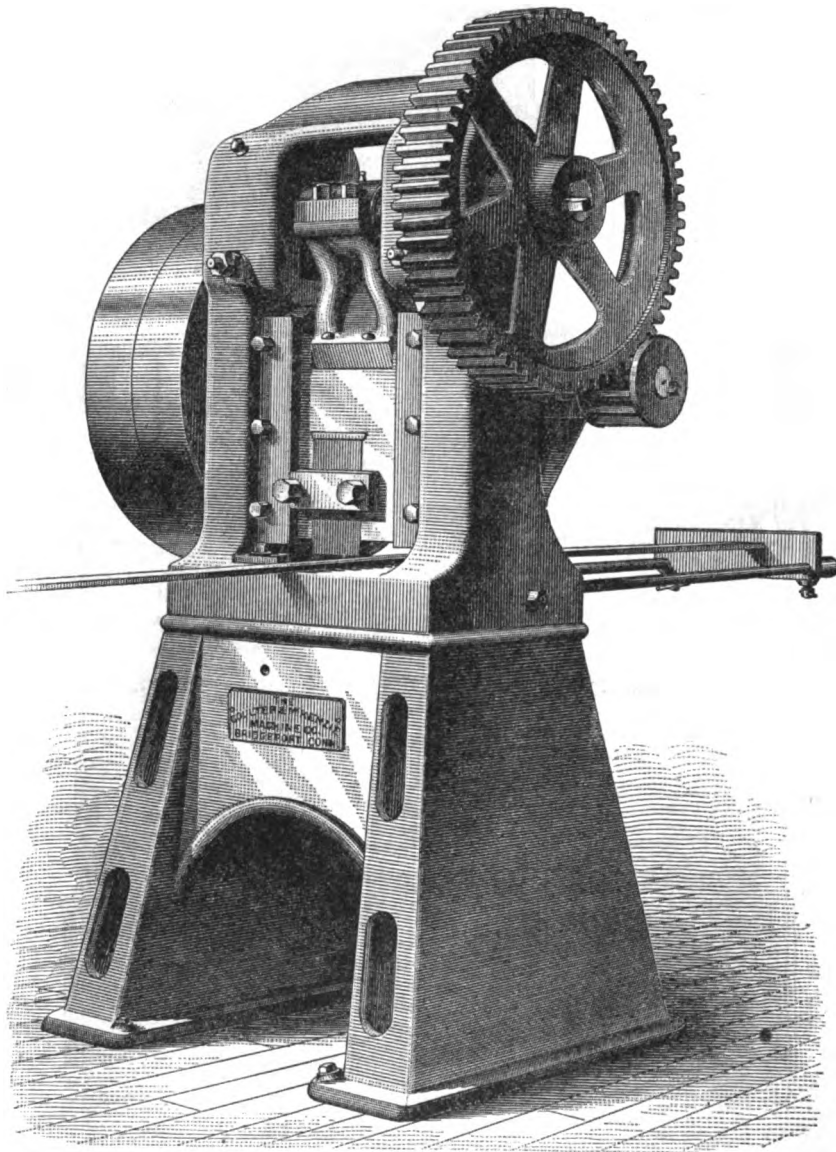
—Some time since Moeller, one of the leading horseshoe nail manufacturers of Germany, declared that after a thorough test his firm, Moeller & Schreiber, of Eberswalde, had reached the conclusion that the only trustworthy material is Swedish iron. Without being discouraged by an earlier failure the Peiner Walzwerke, of Peine, Germany, undertook recently to meet the requirements. They sent a lot of basic steel to the Government testing establishment at Charlottenburg, where

elaborate tests were made. From a detailed report made by Dr. Wedding it appears that the material proved fully the equal of the Swedish iron. We believe that in this country mild steel has also been used with some success in manufacturing horseshoe nails.

### New Shear Press.

The accompanying engraving shows a new and recently-designed shear press which has just been put on the market by the Coulter & McKenzie Machine Company, of Bridgeport, Conn. One of the

and ratified by the United States Government last year after some hesitation. That treaty provides that the subjects or citizens of each of the contracting Governments shall enjoy in all the other countries parties to the convention the same advantages that the respective laws thereof accord to their subjects or citizens so far as concerns patents for inventions, trade and commercial marks and the commercial name. One of the features peculiar to the American patent system, which does not seem to have been closely considered in framing the treaty, gives to citizens of the United States and aliens who have resided for one



SHEAR PRESS, BUILT BY COULTER & MCKENZIE.

main features of the press is the loose pulley, which is the same size as the balance-wheel, and the use of which dispenses with the separate counter-shaft. The knives are made extra strong, and can be used with more economy than formerly. The cuts being long makes large wearing surfaces. The connection is all in one piece, with bearings of unusual length, and the whole machine is strong and solid. It will be observed that this machine requires no expensive foundation. This press was designed expressly for the Spring Perch Company, of Bridgeport, for clipping the ends of steel plates. The same pattern is also used for heavy punching. It weighs 3700 pounds.

An interesting question arose recently regarding the effect of the international convention for the protection of industrial property, proclaimed at Berne in July, 1887,

year in the country and have made oath of their intention to become citizens, the privilege of filing caveats for uncompleted inventions. A citizen of Switzerland, relying on the provision in the treaty above mentioned, lately presented a caveat for an incomplete invention, asking that it be placed in the secret archives of the Patent Office, as provided in the case of citizens. The Patent Office declared that it had no power to receive the caveat under existing laws, holding that while the terms of the convention might be construed to extend the right claimed to the subjects of the signatory Governments, it could only be done after action by the legislative power. This decision of the Patent Office has just been sustained after examination by the opinion of the Attorney-General, who holds that the treaty is not self-executing, but requires legislation to render it effective for the modification of existing laws.



## THE WEEK.

New Haven will expend \$500,000 on the construction of a water reservoir at Woodbridge, on the West Haven River, 6 miles from the city.

The Cunard steamer Umbria made her last trip from New York in 6 days 2 hours and 25 minutes. Three months ago she made about the same time.

Some of the latest-built gunboats, like the French torpedo-boats, are provided with armaments disproportioned to their tonnage, and fears are expressed that some of the American boats after the same model may be equally at fault. Recent reports of the maneuvers of the British naval fleet show that the six vessels of the Archer type pitched and rolled about to such an extent in a moderately heavy sea that the guns were so unstable that they could not be directed with any approach to accuracy of fire. The significance of this report to naval officers here lies in the fact that the new gunboat Yorktown is patterned after the Archer and will carry the same caliber and weight of ordnance. Failure has also attended the efforts of the British constructors to build a 20-knot ship, of which the Navy Department at Washington is attempting to build two under the direction of act of Congress. The Medea, which was built for a 20-knot ship, has never exceeded 19 knots. Other vessels of the same type have failed to develop anything like 9000 horse-power.

Retaliation on the part of Canada may be expected should it prove true that Canadian freight cars coming into the United States and running over United States railroads will now have to pay the regular rate of duty at points of entry. The Treasury Department, it is reported, has had the matter under consideration for some time—in fact, ever since the fisheries trouble. An account kept at some points of entry shows that an average of 300 such cars come in daily at Detroit and Port Huron, Mich., and at Niagara Falls, and that fully 3000 dutiable Canadian cars are in constant use on roads in the United States.

One of the gunners on board the United States warship Trenton, before she was dashed on the reef at Samoa, describes the fury of the tempest. He says: "We were steaming at the rate of 10 knots and had five heavy anchors down. All the vessels had all their masts and yards down, and were making a heroic struggle for existence. The ship seemed fairly to leap out of the water. At times the bows would be lifted entirely out of the water so you could see half their keel."

The total shipping tonnage on the American lakes is shown by the registry of the marine underwriters to have a value of \$43,522,700, exclusive of new craft on the stocks and coming out this season. The vessels are classified as follows:

Class.	Number.	Tonnage.	Value.
Tugs.....	418	11,369	\$2,194,400
Propellers.....	548	361,920	31,124,300
Side-wheel steamers.....	87	14,649	1,798,000
Schooners.....	872	167,890	4,988,000
Lake barges.....	301	129,043	3,414,000
St. Lawrence River barges.....	2	386	4,000
Totals.....	1,678	675,407	\$43,522,700

Including new additions and vessels which have no ratings, the total value is believed to be nearly \$50,000,000.

The difficulties between England and Venezuela being no nearer a settlement than ever, the Venezuelan consul in New York departs from the usual forms of diplomacy by making a public statement in which he says: "England has taken advantage of her superior forces to seize Point Barima, over which Venezuela has always held undisputed sway. The pos-

session of Point Barima implies the entire control of the mouth of the Orinoco, consequently of the whole river, and the river forms, with the Amazon and the Plata, the prodigious fluvial net of South America, connecting with each other through all its different branches some well-known rivers and others yet unexplored. Thus the ruler of the Orinoco can travel to Colombia by the Meta, to Peru and Bolivia by the Ucayale, to Ecuador by the Mapo and the Branco, to Brazil by the Rio Negro, Marañon and Branco; to Paraguay and Montevideo by the affluents of Marañon, and all that is lacking is a communication for a distance of about 12,000 yards in order to communicate with Buenos Ayres."

The Florida land investments of the Disston saw manufacturers are resulting in an important addition to the productive sugar regions of the South. A new factory opened at Kissimmee this season is said to have turned out 1,500,000 pounds of sugar from 8800 tons of cane, a yield exceeded by only three of the thousand sugar factories of Louisiana. A New Orleans paper says: "There is no telling what the extension of the Florida sugar interest may be, now that machinery is reclaiming the rich sugar lands of that State. Texas claims to have 400,000 acres of fine sugar lands in the lower part of the Brazos Valley, and is rapidly developing the industry in that region, where a central factory is claimed to have made last year a larger crop than that manufactured from any single estate in Louisiana. The capacity of Florida for sugar production is yet unknown, though it may equal that of Louisiana."

The Beet Sugar Company has been incorporated in San Francisco, with a capital of \$5,000,000, the Spreckels holding half of the stock. The object is to erect large sugar refineries at various points on the coast, in addition to one already established at Watsonville, Cal., in the expectation of refining 50,000 or 60,000 tons of sugar a year.

The cost of the Paris Exposition this year is expected to be \$10,000,000, of which fully one-half will be borne by the Government.

The lamentable death of Postmaster Henry G. Pearson, after many years of unswerving fidelity in public service, leaves the position vacant until May 1, at which time the postmaster-elect, Cornelius Van Cott, will enter upon his duties. Meanwhile, ex-Postmaster-General James is acting postmaster at New York.

Liverpool, England, is to have an elevated railway on the line of the docks, about \$2,000,000 having been promptly subscribed for this purpose. It is safe to predict that New York City will eventually be provided for in like manner, so that pedestrians and vehicles will no longer be intermingled at the various ferry landings on the same level.

The New York Nautical Schoolship St. Mary's has received about 90 applicants for instruction in practical seamanship and will soon have her full complement of 125. The Philadelphia Schoolship Saratoga is being similarly organized.

The American adviser to the Korean King, O. N. Denny, is reported to have resigned his position, and, according to a telegram from Seoul received in Yokohama, the consideration was \$30,000, received from Li Hung Chang, representing the Chinese Government, to whom Judge Denny's presence has been an offense.

The Board of Bureau Officers which has been considering the proposals received for building the armored coast-defense vessel has completed its work and reported to the Secretary of the Navy. It is understood that the board finds that it

is not possible to build the vessel under the lowest bid (\$1,614,000) and comply with the terms of the act of Congress, which fixes the total cost of the naval rams, batteries and other naval structures to be built under its authorization at \$2,000,000. Out of this total must come the armor for the coast-defense vessel, which is not to be furnished by the contractor, and which will cost \$350,000, anchors, boats, &c., and the submarine boat for which proposals were received some months ago.

The Boston Navy Yard has been practically idle for several years on account of the lack of Government work and because the great bulk of construction has been given to private firms. Boston realizes the advantages to be obtained by having built at that yard one of the new big cruisers to be begun during the summer, and efforts will be made to have it assigned there.

Oil lands in Ohio comprising 25,000 acres have been purchased by the Standard Oil Company, and besides extending a pipe line to the Pennsylvania oil fields they are making extensive improvements, with the object, it is said, of refining Lima oil and sending it out in tank cars to distributing centers. It is denied that there is any intention of abandoning Pennsylvania, as reported.

The Illinois House has passed the bill providing for widening and deepening the Illinois and Michigan Canal to the dimensions of a ship canal from Chicago to its connection with the Illinois River, and the improvement of the latter to a corresponding degree to its connection with the Mississippi River. This enterprise, which so long has occupied the attention of Congress, is now looking in the right direction for patronage—to the State Legislature rather than to the general Government.

The Mayor of Baltimore says that city is growing faster than any other in the country, unless some of the mushroom towns in the West are excepted, and that the population numbers 500,000.

The bar at Atlantic City has been made impassible by recent storms.

Mayor Grant hastens to clear the streets of electric wires, availing himself of the authority conferred by law, as recently decided in the courts. The companies affected are now most concerned to save their property from seizure and find it necessary to move with speed. The streets from which poles have been removed appear to be much wider than before.

Shipments of arms from New York to Hayti continue.

The Lake Shore and Michigan Southern Company have ordered 25 new engines from the Schenectady Locomotive Works. Three of the number are heavy passenger engines, 15 Mogul freight engines, and the others are designed for switching purposes.

The failure of the Callender Insulating and Waterproofing Company, whose factory is at Harrison, N. J., involves several New York firms to some extent, but what percentage of loss will be shown in the settlement with creditors cannot be known at present. The plant is said to be mortgaged for \$100,000. Among the creditors Fuller Bros. are mentioned and others whose amounts are not so large.

Australian advices respecting the partial failure of the wheat crop indicate a total deficiency in New South Wales, Queensland and Tasmania of 8,750,000 bushels, while Victoria, South Australia and New Zealand have an available surplus of 9,500,000 bushels, or 75,000 bushels more than the deficiency of the other three

colonies. Considerable engagements have already been made for further shipments to Europe from New Zealand, Victoria and South Australia.

One of the most destructive fires in New York for many years occurred on Friday night, when all of the docks and buildings on the North River water front from 58th street to 70th street, together with freight-houses and two grain elevators belonging to the New York Central Railroad Company, were totally destroyed. The loss will amount to at least \$3,000,000.

The exportation of live cattle from New York has suddenly grown to large proportions, demanding all the available room on the outgoing freight steamers. The aggregate shipments from New York, Boston and Baltimore last week comprised 14,200 head, the largest in the history of the trade. Beef is much cheaper here and in better condition than usual, owing to the abundance of corn.

The Canadian Government has published a record of changes in transportation effected by the construction of the Intercolonial and Canadian Pacific railroads. According to this report, the traffic handled by United States lines for Canada (in intercolonial trade and foreign commerce) has declined to one-half the amount carried the year before the Intercolonial road was opened. In 1875 the railroad lines of the United States carried \$46,000,000 of Canadian merchandise between points in the Dominion and between Canada and our seaports. In 1888 this traffic dwindled to \$23,000,000.

The pernicious operation of the Yates prison bill becomes more evident every day in the experience of New York State. This year there is already a deficit of \$192,388.97 for the past six months, and there are more convicts confined than ever before, with the number increasing, due to the fact that the county judges, instead of sending prisoners to the penitentiaries, as they are no longer self-supporting, prefer to confine them in the prisons as a burden to the State. Within the past six months 37 convicts have been locked up in the Auburn Insane Asylum, an increase of 27 over the number for the same time last year.

Emigration to the United States has commenced in earnest this spring at various European ports. Four thousand, mainly Germans and Swedes, sailed from Liverpool in a single day. The movement is said to be more voluntary in character and less the work of agents than hitherto. The increase is due to the pressure of military duty and taxation.

The alleged electric sugar frauds hang fire in the courts. Ever since Mrs. Olive E. Friend was arrested as being one she has been confined in the Tombs, as she has been unable to procure a bondsman for \$7000. She still maintains that her husband really possessed the secret of refining raw sugar cheaply and quickly by means of electricity. Assistant District Attorney Davis, who is in charge of the case, has not as yet been able to prepare for trial, but he is very positive that the whole scheme was a swindle.

The Edgemoor Iron Company have taken the contract for an iron bridge across the Delaware, at Portland, Pa., to perfect the connection with the Poughkeepsie Bridge.

Port improvements at Buenos Ayres are so far advanced that steamships are no longer compelled to anchor far from the shore and lighter their cargoes to the city. The first section or basin was formally opened January 28. United States Consul Baker says there are three other basins of equal size with the one just opened in process of construction, connected by gates and with deep canals on each side,

all of them approached from the outer roads though the outer channels of the Riachuelo, and within two years it is expected that the entire port will be open to commerce.

The Interstate Commerce Commission decides that a rebate allowed by the Grand Trunk Railway of Canada in transporting coal and coke from Buffalo and other points in the United States to various points in Canada is illegal. The question at issue arose between the Michigan Central and the Grand Trunk, especially in regard to the movement of anthracite coal to various points in Canada. Both make large shipments into Canada. The latter company have seen fit, according to the statement of General Manager Hickson, "to make special rates to the principal points for large shipments." As the Michigan Central are not permitted by the Interstate act to do the same thing, and competition under such circumstances is disadvantageous to that company, they have appealed to the commission and have had a hearing, with the result mentioned above.

Further particulars respecting the loss of the steamship Danmark, obtained from her engineers, show that the disaster is primarily due to the bursting of a steam-pipe, or a breaking down of the engines, when the steamer was within 800 miles of the coast of Newfoundland. The engineer was killed on the spot and the ship was badly damaged. In consequence of this damage, together with the breaking of the shaft, the vessel was helpless in the heavy seas, making it necessary to abandon her. The steamship Missouri rescued the passengers and towed the Danmark two days, until April 6, when it was decided to leave the wreck and sail direct to the Azores.

Mrs. Maria St. John Sheffield, widow of Joseph Earl Sheffield, donor of the Sheffield Scientific School at New Haven, died in that city on Sunday night. In 1860 Mr. Sheffield gave to the scientific department of Yale the building now called South Sheffield Hall. By Mr. Sheffield's will the "homestead" was to go to the college after the death of Mrs. Sheffield. This property is now valued at \$250,000. Property on Chapel street, in which the school has an interest, will increase the amount to nearly \$600,000.

The value of the fisheries of Canada, which have been so much a subject of international dispute, decreased nearly \$1,000,000 during the year 1888, as shown by the official report, as follows:

Nova Scotia .....	\$7,817,080
New Brunswick .....	2,941,868
British Columbia .....	1,902,195
Quebec .....	1,860,012
Ontario .....	1,839,969
Prince Edward Island .....	876,862
Manitoba and Northwest Territories .....	180,877

Showing an aggregate of ..... \$17,418,510  
As against \$18,386,103 for the year 1887,  
or a decrease of \$967,592.

At the first general meeting of the subscribers to the Meigs Elevated Railway, held recently, the charter of the corporation was approved and it was decided to issue stock to the amount of \$200,000. From this it would appear that this scheme, which has languished long and which really embodies new methods of elevated railroad construction and operation, is about to assume a more tangible form.

An acid trust was organized at Middletown, N. Y., lately by 35 leading manufacturing concerns, with John Bayless as president. Pyroligneous acid and charcoal are the first products of the distillation of wood confined in sealed iron retorts and subjected to intense heat. The acid when subjected to a further process yields what are known as the wood alcohol, acetate of lime and naphtha of commerce. The

alcohol is the most valuable product, inasmuch as it affords a cheap substitute for grain or fruit alcohol in the arts and for mechanical and manufacturing uses. There are 60 acid factories in the wooded region comprised within the bounds of Sullivan, Delaware and Broome counties, New York, and Wayne and Susquehanna counties, Pennsylvania, and perhaps a dozen others in West Virginia, Kentucky and Tennessee. The value of the total annual output of the factories is estimated at \$2,500,000.

The Ericsson Coast Defense Company have filed their certificate of incorporation. The company's capital is \$250,000 and their object the manufacture and sale of boats, vessels, guns, machinery and other appliances. The incorporators are George H. Robinson, William Williams, Ericsson F. Bushnell, Cornelius S. Bushnell and Edward S. Innet.

Findlay, Ohio, and Tiffin also, on the natural gas belt, are astonished by the copious flow of gas from newly-drilled wells. A well struck last week is said to have a capacity of 30,000,000 and another 20,000,000 cubic feet of gas per day. At Tiffin the pressure of an old well increased suddenly, blowing out the casings of the well and bursting pipes in a factory which used the gas. This well has an estimated capacity of 28,000,000 feet per day.

According to the *Ironmonger* the three great telephone companies of England have, after protracted negotiations, agreed to amalgamate, subject to confirmation on the part of the shareholders. The total value of their properties is close upon 4,000,000 sterling, and the present total revenue £400,000. The amalgamated companies intend running telephone wires between all the great towns in England.

The *Leader*, of Pittsburgh, reports as follows respecting an experiment in copper welding recently made in that city: "James Burns, representing the Burns Copper Welding Company, took possession of an ordinary blacksmith forge, and with a rod of copper  $\frac{1}{2}$  inch in thickness began operations. After the flattening process usual in such work he formed a disconnected ring. The usual 'scarfing' process followed, then the operator, after sprinkling a powder over the piece, proceeded to make a weld which when cooled showed a perfect union. He then took the ring, measuring 2 inches in diameter, and submitted it to a strain until it had widened  $\frac{1}{2}$  inch. This demonstrated conclusively that the union of the two ends of the rod was not the mere 'brazing' known to mechanics to-day. Other experiments were made, and in every case the spectators expressed themselves as being satisfied that the process was a complete success. Some of those who watched the work have spent years in working among metals, and consequently were well justified to express an opinion in regard to the copper-welding process."

The final arguments in the case of Andrews Bros. & Co., of Youngstown, Ohio, vs. the Youngstown Coal and Coke Company, Limited, were heard in the United States Circuit Court at Pittsburgh last week. An interesting point is involved in this suit. Three years ago the Youngstown Coal and Coke Company agreed to furnish the plaintiffs coke at the rate of 95 cents per ton. Last November the price of coke went up and defendants refused to furnish any more at the price agreed upon. They claimed that the agreement made between the firms was illegal, having been entered into by but one member of the limited firm. The law provides that two members of a limited concern be parties to an agreement. Andrews Bros. & Co. bring action in equity for a new contract, there being no legal redress on the old one.

## MANUFACTURING.

### Iron and Steel.

On Tuesday, the 16th inst., the employees of the Allegheny Bessemer Steel Company, of Pittsburgh, whose works are located at Duquesne, Pa., went out on a strike, and at this writing every department of the extensive plant is idle. Several weeks ago the rail straighteners, drillers and telegraphers, about 45 men in all, struck for the same wages paid at the Edgar Thomson Steel Works. They were receiving \$2.50 per day. The firm offered to increase their wages to \$4.50 per day; but they would not return to work unless the firm would consent to discharge a man who had refused to stand with them in their demand for more money. This the firm refused to do, with the result that every man employed at the works at once stopped work. The company have made application to the Governor for the appointment of 25 coal and iron police officers. The men will be assigned to duty as soon as their commissions arrive, protecting the property of the company and their men.

One hundred coke ovens are being built by the Cameron Coal and Iron Company at Emporium, Pa. The company's blast furnace at that point is turning out 100 tons of pig metal a day.

Lean & Blair, engineers and contractors, of Pittsburgh, are erecting a 2-ton Lash open-hearth steel-melting furnace for the Johnson Company, of Johnstown, Pa.

The Penn Bridge Company, of Beaver Falls, Pa., manufacturers of bridges, roofs and structural ironwork, are operating their works to their fullest capacity, with sufficient orders on hand to keep them busy for two months to come.

The threatened strike of the furnacemen in the employ of the Crane Iron Company, at Catasauqua, Pa., on account of a reduction of wages, passed over without a cessation of labor, the employees concluding to accept the reduction. In consequence the fillers commenced re-filling on Saturday, the 13th inst., and Nos. 4, 5 and 6 furnaces are casting iron as usual. No. 8 was in need of repairs and allowed to go out. No. 1 is also undergoing repairs.

The annual meeting of the stockholders of the Birmingham Rolling Mill Company was recently held at Birmingham, Ala., and resulted in the selection of the following officers: G. W. Norton, president; W. B. Caldwell, vice-president; B. Du Pont, treasurer; John B. McFerren, W. W. Hite, W. P. Harvey, and J. G. Caldwell, all of Louisville, directors. "As the fiscal year of the company does not end until June, there were no formal reports, but the condition of the industry as shown to the stockholders was more than satisfactory."

The Standard Iron Company, of Bridgeport, Ohio, are erecting a large building for the purpose of taking care of their increased corrugating business, which has so grown that they were not able to handle it in their old buildings. With the new accommodations the new company will have a capacity for painting and corrugating 50 tons of sheets per day, probably the largest capacity of any concern in this line in the country.

The Columbia Rolling Mill Company, at Jersey City, N. J., are progressing with their improvements and extension. They have just completed the erection of four reverberatory furnaces, a smelter, and the putting in of a 10-ton coal scale, and are sending out proposals for two 100 horse-power boilers, a 150 horse-power engine and the necessary machinery for running

four pairs of rolls, which when completed will greatly facilitate and increase their capacity for production.

Spearman, Collord & Co., of Sharon, Pa., who have been operating the Sharon Furnace, at that place, under lease for some months, have declined to purchase it at the option they have held on it for some time. Their present lease expires on July 1 next. The furnace is owned by Boyce, Rawle & Co., of Sharon, Pa.

The blast furnace, engines and other property of the old Duluth Iron Company were sold on the 6th inst. to satisfy a mortgage judgment of \$130,000. In 1888 Walter Mann, of St. Paul, the trustee of the property, purchased 100 \$1000 shares of stock, and when the company stopped business a mortgage and trust deed was executed to him to make good his interest in the concern. There were no bidders for the property besides Mr. Mann.

The large new plate mill recently erected by the National Tube Works Company, of McKeesport, Pa., was put in operation last week.

During the month of March last the two stacks of the Isabella Furnace Company, at Etna, Pa., produced 11,194 gross tons of foundry pig iron.

The nail factory of P. L. Kimberly & Co., Limited, at Sharon, Pa., containing 40 nail machines, is in full operation making both iron and steel nails. We are informed that the report that this firm were making a combination iron and steel nail is without foundation.

C. Burkhart & Co., proprietors of the Falling Spring Charcoal Furnace, at Chambersburg, Pa., which has been idle for some time, have leased the furnace for one year to Burkhart & Co., who expect to put the furnace in blast some time in July next. It will produce cold-blast charcoal iron and is expected to turn out about 15 tons per day.

Mont Alto Furnace, of the Mont Alto Iron Company, at Mont Alto, Pa., was put in blast on the 8d inst., after being thoroughly repaired and relined. It is expected to turn out about 30 tons per day of hot-blast charcoal iron.

On the afternoon of the 11th inst. the American Tube and Iron Company, of Middletown, Pa., received a cable message from Russia ordering 30,000 pounds of casing to be sent to a particular point in the Russian oil territory as soon as possible. The general superintendent of the company, Mr. A. S. Matheson, at once made preparations to fill the order at the earliest possible moment. When the cablegram was received the iron for the tubing was in the rough at the rolling mill in York, and it was at once forwarded to Middletown. The rolls that make the pipe were speedily changed, the millmen set to work with a will, and so successful were the efforts of the superintendent that the pipe was delivered at the ship's side on the night of the 12th inst., and on Saturday morning in the vessel *en route* to Russia. The above company have also recently received an order from the Citizens' Natural Gas Company, of Lafayette, Ind., for 27 miles of 8-inch pipe, and will also furnish 20 miles of standard 8-inch pipe of superior requirements to the National Transit Company for their oil line to Cleveland, Ohio. The company have contracted under forfeit to ship these parties an aggregate of over a mile of pipe per day.

We are informed that the report that J. Morgan Coleman, of Youngstown, Ohio, had commenced the erection of a rolling mill at New Birmingham, Tex., is without foundation.

Ella Furnace, at West Middlesex, Pa., operated under lease by the Wheeler Furnace Company, of Sharon, will be blown out at an early date for extensive repairs.

The plant of the Warren Tube Company, at Warren, Ohio, which originally cost about \$150,000, was sold at sheriff's sale on Saturday, the 13th inst., to O. C. Barber, of Akron, Ohio, for \$35,000. It is reported that Mr. Barber represented the majority of the original stockholders, and the works are now practically in the hands of the builders. It is also stated that the plant will be put in operation at an early date.

Hecla Furnace, of the Hecla Iron and Mining Company, at Ironton, Ohio, is being extensively repaired and will be ready to resume blast in a few days.

About one month ago the hot-bed men, the telegraphers and furnacemen at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., received notice that they would get an increase in wages, the same to be paid by a percentage on all rails produced over 1200 a day. At that time the engineers, hot and cold saw men and water-tenders asked for a similar advance, but were refused. At the last pay the advance was voluntarily granted. The roll hands were given a like increase.

The new rod mill now in course of erection by the New Castle Wire Nail Company, at New Castle, Pa., will have a capacity of about 150 tons of nail wire per day and will employ 200 men. The company will use about 100 tons of this product per day and will dispose of the rest.

The ore property formerly owned and operated by the Pittsfield Iron and Steel Company, of Pittsfield, near Rutland, Vt., including concentrator, Catalan forge and machinery, is offered for sale by U. K. Flagler, Boston, Mass.

The works of the Trinidad Rolling Mill Company, at Trinidad, Col., have begun operations. The works have a daily capacity of 25 tons of merchant iron. The machinery consists of a battery of four 125 horse-power boilers, feed-water heater and steam boiler and supply pumps, one 500 horse-power engine, operating an 18-inch bar train complete, a 300 horse-power engine with 12-inch roll train, two heating furnaces, large and small shears (with independent upright engines), cold saw, lathes, cranes and all other necessary appurtenances, the machinery having been made by the Lewis Foundry and Machine Company, of Pittsburgh. The product will consist of square, flat, round, half-round, diamond and mine T-rails. In this connection the New Mexican Iron Company make a proposition to Trinidad for the location of an iron blast furnace at that point.

The National Forge and Iron Company, of Chicago, have made arrangements to build their works at East Chicago, Ind., where they have secured a tract of 12 acres, with excellent facilities for rail and water transportation. The proposed location at Burnside was abandoned because of conflicting claims over the ownership of the land. The site now secured is in the immediate vicinity of the works of the Chicago Horseshoe Company and the car-wheel works of C. A. Treat, both of which are nearing completion. The machinery for the forge company is all under contract, and the erection of their buildings will be actively pushed in order to receive it as soon as it is ready to put in place.

The *Mining and Scientific Press* is authority for the statement that the Puget Sound Iron Works, at Irondale, Wash., will increase their capital stock, which is now \$1,000,000, with the view of

erecting rolling mills, to engage in the manufacture of steel and wrought iron in connection with their output of pig iron.

#### Machinery.

The Westinghouse Electric Company, of Pittsburgh, have received an order for 3000 incandescent electric lamps for a central station plant at St. Joseph, Mo.

The stockholders of the Arms, Bell & Co. Nut and Bolt Works, at Youngstown, Ohio, destroyed by fire two weeks ago, have decided to rebuild as soon as their insurance is adjusted. An entire new line of the most improved machinery will be placed in the plant, the intention being to make it a model concern.

The Ottumwa (Iowa) Iron Works, manufacturers of coal-mining machinery, have just issued a catalogue from which a good idea can be formed of the various machines made by them. Their catalogue shows their first and second motion hoisters, their tail-rope and endless-rope engines, pumps, ventilating fans, elevators and cages, coal cars, pulleys and shafting, presses, rolls and grinders, pipe and fittings, &c. The catalogue also describes the Ramsay coal distributor, which is made by the Ottumwa Works.

The new illustrated catalogue of the Rand Drill Company, of this city, contains, in addition to descriptions and engravings showing the various machines they manufacture, much interesting and valuable information relating to mechanics. The catalogue is divided into four parts, the first of which treats of drills and mountings, air compressors, boilers, air receivers, pumps and supplies, pipe and fittings. The second book, bearing the title "Useful Information," deals with compressed air, steam, transmission of power and miscellaneous matters. The third book is entitled "Work Done," and illustrates mining, quarry, tunnel and sub-marine work. The last book contains comparisons and tests. The engravings are fine specimens of work, and were so selected as to well illustrate the various products of the company. Much of the "Useful Information" is original, and will certainly prove "useful" to those studying the subjects treated.

The Buckeye Engine Company, of Salem, Ohio, have just published three catalogues, bound separately. The first describes and illustrates all the parts of the engines made by this company, so that an accurate conception can be formed of their construction and operation. The second presents a few admirable wood-cuts of different types of engines, after which follows an instructive description of the use and management of the indicator and useful data on steam and steam-power plants. The matter bears evidence of careful preparation, and will be found of value by those interested in steam. The third part is a list, covering some 36 pages of type, giving the names and addresses of those who have used the Buckeye automatic cut-off engine since its first introduction in 1874. In the introduction we find the following statement: "We hope the intending purchaser who is not familiar with the merits of the engine will refer directly to any of the addresses given, and we are ready to accept an intelligent judgment of that portion of the record which he may get."

The Topeka Rapid Transit Railway, the equipment of which has just been finished by the Thomson-Houston Electric Company, was put in operation on the 3d, the trial trip, made with four cars filled with invited guests, being most successful in every way. This road is the largest in the world (14 miles, 20 miles of track) and is probably the finest electric railway in the West. The power station is located at the corner of Jefferson and Second

streets. It is a two-story building, 100 feet front and 85 feet deep, and has a 125-foot chimney. The power plant consists of two Corliss engines of 600 and 800 horse-power, respectively, steam for which is supplied by five boilers, 6 x 16 feet. The electrical apparatus consists of six 30 horse-power Thomson-Houston generators, with switchboard and all necessary appliances for the same.

The Jeffrey Mfg. Company, of Columbus, Ohio, were the pioneers in this country of coal-mining machinery, and their productions are well and widely known. They have not confined their attention to mining machines alone, but have obtained control of valuable patents for chain belting, which is extensively used for elevators, conveyors and driving belts for handling grain, coal, ores, &c; they also control the manufacture of the Slater bolting reel, the Gregory grain drier and the Wilson spring whiffletree. Their new works consist of five departments—the foundry, machine shop, blacksmith and wood-working shop. The cutter works is equipped throughout with improved machinery especially adapted to the work.

On and after May 1 the Prentiss Tool and Supply Company, now located at 42 Dey street, will be the New York agents for the Putnam Machine Company, of Fitchburg, Mass., and will remove their offices to 115 Liberty street, where a full line of the many excellent tools made by the Putnam Company will be kept on hand.

#### Hardware.

The Erie Specialty Mfg. Company, Erie, Pa., have been organized for the manufacture of hardware specialties, including cork-pullers, lemon-squeezers, ice-shaves, milk-shakes, cigar-cutters &c., most of which have been invented by E. Walker, who is manager of the company.

Johnson & Colton, Montpelier, Vt., manufacturers of saddlery hardware, have recently moved to new quarters in a building 100 x 35 feet and four stories high. The change was made necessary by the enlargement of the business, which was established a number of years ago and has been growing steadily ever since.

The firm heretofore known as W. R. Baker & Sons, Watertown, N. Y., has been incorporated as the W. R. Baker Mfg. Company. They will continue making special and boat hardware, and with additional capital will increase their manufacturing facilities and enlarge their plant. Their foundry facilities especially will be greatly increased, and they will hereafter be able to furnish brass and bronze castings for all purposes. W. R. Baker, the president, will, as heretofore, have charge of the mechanical department; W. W. Sherman, the treasurer of the company, will manage the general office affairs; and Pitt J. Baker, secretary, will take charge of the general selling and advertising of the concern.

The business of the Withington & Cooley Mfg. Company, Jackson, Mich., is increasing so rapidly that additional room is needed, and they are now having the plans drawn for a large building to be erected just north of their office and warehouse. The exact dimensions of the building are not yet announced, but it is stated that it will contain about 25,000 square feet of working room. It will be of brick, two stories in height, with a basement. When completed it will be used as their wood-working department, the work of putting handles on the tools being done there. This will give employment to about 50 men in addition to their present force. The company, we are advised, have recently been obliged to refuse an order for 14,000 dozen Forks from France because they had not the facilities to fill

it. The company are investigating the merits of crude petroleum as a fuel. Three new boilers are also being put in.

#### Miscellaneous.

A press dispatch from Akron, Ohio, under date of the 19th inst., says: "A meeting of Akron capitalists who had subscribed \$25,000 among themselves and Messrs. Loomis and Loyd, of the Loomis Fuel Gas Company, was held in this city to-day and arrangements made for the incorporation of a company with \$100,000 capital to build a fuel gas plant in Akron immediately."

The largest compressed-air establishment in the world is at Paris. It has a plant with 5000 horse-power. Begun in 1881 to distribute the power necessary for the driving of pneumatic clocks, it was not long before it was discovered that the air could be profitably used for two other purposes—to distribute motive-power to manufacturers by day and to produce electricity for lighting by night. The works, which are on the heights of Belleville, on the edge of the city, now occupy an area of 107,500 square feet, or 2½ acres, two-fifths of which is covered with buildings.

A new company has been formed in Norristown, Pa., for the manufacture of steam heating boilers, &c., under the name of Schimpf & Keim Boiler and Mfg. Company. Thomas G. Lovegrove, of Philadelphia, president.

The Lehigh Zinc and Iron Company, of Bethlehem, Pa., have purchased the Joplin Zinc and Smelting Works and 2140 acres of mining lands within a few miles of Joplin, Mo. A greater portion of the territory has already been developed and is ore producing. The aggregate price of the various properties is reported to have been about \$175,000. The company will at once enlarge the zinc smelting works and add a plant for manufacturing sheet zinc. To this enterprise the citizens contributed \$10,000, the company later agreeing that the plant shall have a capacity of producing 20,000 pounds of manufactured zinc a day, and to cost not less than \$250,000.

The Wetmore Canning Factory have just been organized at Wetmore, Nemaha County, Kan., and are making arrangements for the prosecution of their business. Their capital stock is stated to be \$10,000.

Among corporations recently authorized by the State of Illinois are the following: Northwestern Horse-Nail Mfg. Company, Chicago; capital, \$250,000; to manufacture horseshoe nails and other metallic products; incorporators, Russell Jones, John R. Corwith, Charles Fargo. The Murphy Car-Door Company, at East St. Louis; capital stock, \$50,000; for the manufacture of freight-car door fasteners; incorporators, P. H. Murphy, W. S. Wilson, D. Kennedy and F. W. Smith. The Page Woven Wire Fence Company, at Chicago; capital stock, \$40,000; for the manufacture of wire fence and machinery for manufacturing the same; incorporators, N. L. Clement, Austin Clement and Edward B. Bacon. The Lone Star Iron Company, at Chicago; capital stock, \$1,000,000; for mining, smelting and manufacturing iron products; incorporators, John A. Kruse, P. J. Howard and E. P. Atfield. The Osborne Steam Heating Company, at Chicago; capital stock, \$20,000; to manufacture and operate appliances for heating, power, lighting and other purposes; incorporators, Jesse Cox, Gideon F. Lanaghan and Eugene F. Osburne. A certificate was filed to record the increase of the capital stock of the Griffin Wheel and Foundry Company, of Chicago, from \$100,000 to \$150,000.



# The Iron Age

New York, Thursday, April 25, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## A Western View of the Pittsburgh Freight Question.

The Chicago iron and steel manufacturers are naturally very much interested in the agitation of freight tariffs by the Pittsburgh manufacturers. The former understand the situation very thoroughly, having themselves been handicapped at times in the past by freight rates which operated to their disadvantage and consequently benefited their trade competitors. A man familiar with the course of the iron trade for but a few years can recall instances of this kind. Chicago was then at the mercy of the older iron centers of the East whenever prices of finished products were very much depressed. Raw materials were always dearer and wages were higher, while the railroads had a system of rebates which gave the Eastern manufacturer an advantage that could not be accurately measured, because it was usually shrouded in secrecy. The growth of Western manufacturing establishments was, under such circumstances, the creation of periods of activity when Eastern works could not supply the demand. It is not singular that Eastern manufacturers hope to keep up the old order of things and believe that they should still control the markets of the West. The discrimination of the coke-carrying railroads in favor of Chicago is regarded as the one impediment in their way, and they insist upon its removal. The Ohio manufacturers of pig iron also find themselves handicapped by the high freight rate to Chicago on their product, and they are seeking to have it reduced to the figures of former depressed times, so that they can again, as they believe, reach the Chicago consumer. On all sides the railroads are attacked as the chief offenders in keeping Eastern products from getting their share of Chicago business.

Now, the Chicago manufacturers do not see matters in the same light. Remarkable changes have occurred in the recent history of the iron trade, and they have inured steadily to the benefit of the men who risked their fortunes on the southern shores of Lake Michigan. Raw material has been greatly reduced in cost, labor is much more abundant and wages are not so extravagantly high as they once were, capital can be had without the enforced payment of usurious rates of interest, and the new Interstate Commerce act at least puts all competitors on an equal footing in requiring open rates to be made. The Northwest has at last become a practical manufacturing district, able to operate independently, and it moves forward in dull times, instead of only marching in company with the older sections of the country whenever the bugle of prosperity sounds an advance.

According to our Western friends, the war upon the high freight rates which now

disturb the serenity of the once imperturbable Pittsburgh community is not attacking the root of the difficulty. The increased cost of manufacturing iron and steel due to the excess charged over what is claimed to be a just rate will not restore to the East its former supremacy in Western markets if the reductions asked are granted by the railroad authorities. The Western manufacturers will endeavor to meet the new conditions of trade, and their progress in the recent past appears to give them a confidence in the future which they at one time did not possess. The struggle between the East and the West has begun on a more favorable footing to the latter, and it would not be surprising to see concessions made by the former which were wholly unanticipated but a few years since.

Our sympathies in this matter are with both sections. The real trouble arises from the dullness of trade, which prevents even the leading establishments of any part of the country from securing orders sufficient to keep them running at a profitable rate. Until business revives this general feeling of dissatisfaction and restiveness will continue, and all items of cost and charges will be attacked in the hope that they can be scaled down. The freight rates now charged were not deemed high until competition began to pinch the manufacturers in quarters in which they had previously had little trouble in getting business. It would be idle to counsel patience to men under such circumstances. Impatience will not hasten the return of prosperity a month or a day or an hour. The chief cause of trouble in the iron trade to-day is the limited demand from the railroads, whose net earnings are too small to enable them to buy what they really need.

Emphasis is given to the statement recently made in *The Iron Age* that the prosperity of iron and steel makers abroad, in spite of small orders from this market, is due to the larger business in other quarters, by the figures lately published in England and Germany. William Fallows & Co., of Liverpool, estimate that home consumption of pig iron in 1888 was 4,133,016 gross tons, as compared with 3,170,160 tons in 1887, 3,842,221 tons in 1886 and 3,626,192 tons in 1885. In other words, English consumption jumped nearly a million tons. This is partly due, of course, to a better demand for machinery for export, the Board of Trade returns showing £9,745,685 in 1888, as compared with £8,330,971 in 1887 and £7,124,270 in 1886. The greatest progress in any one industry has been in ship-building, the tonnage completed in 1888 having been over 900,000 tons, while at the beginning of the current year the new shipping laid down or contracted for reached the enormous amount of about 1,250,000 tons. It is necessary to state, however, that this has begun to tell on rates of freight throughout the world, a decline having set in during the past month. Germany, too, has experienced a revival which explains the indifference of its manufacturers to American orders. Statistics recently published show that the consumption of pig iron in Germany increased from 3,798,459 metric tons in 1887 to 4,231,199 tons in 1888. It is certainly not surprising that with nearly 1,000,000 tons added to

the consumption in England and 500,000 to that of Germany the European makers can see the American demand reduced to a minimum without feeling its absence keenly.

## The Report of the American Iron and Steel Association.

The statistics of the production of all forms of iron and steel in the United States in 1888 will be found in very compact shape in the annual report which has just been issued by James M. Swank, general manager of the American Iron and Steel Association. This report has been printed earlier in the year than any of its predecessors, and thus comes more closely to realizing the full value of statistics of the character treated in its pages. In this respect no statistical office in the world, particularly those operating under the direction or patronage of the various governments, has as good a record. The fullness of detail which has always characterized the association's reports is a conspicuous feature of this latest addition to their publications. The leading products of the iron and steel industries of the country are shown to have been as follows in the past calendar year as compared with the preceding year, using gross tons, which the trade generally employs:

	1888. Tons.	1887. Tons.
Pig iron.....	6,496,738	6,417,148
Bessemer-steel ingots.....	2,511,161	2,936,033
Open-hearth steel ingots.....	814,318	332,069
Cast-iron steel ingots.....	70,279	75,378
All forms rolled iron.....	2,153,263	2,311,161
All forms rolled steel.....	2,464,087	2,944,545

Included in the totals of the above table are the following products, which are given separately to avoid duplication and perplexity, also using gross tons:

	1888. Tons.	1887. Tons.
Bessemer-steel rails.....	1,386,277	2,101,904
Iron rails.....	12,725	20,501
O. H. steel rails.....	4,697	17,145
Iron bars and shapes.....	1,624,029	1,711,967
Steel bars and shapes.....	699,301	472,312
Iron plates and sheets.....	419,049	425,943
Steel plates and sheets.....	190,798	177,412
Iron cut nails.....	56,879	152,660
Steel cut nails.....	198,012	155,772
Wire nails.....	66,964	55,804

\* Excluding nail plate.

From these tables it will be seen that the production of 1888 corresponded very closely with that of 1887 in almost every line, in some cases making a decided gain, as in pig iron, steel bars and shapes, steel plates and sheets, steel cut nails and wire nails. The only falling off of consequence was first in Bessemer steel rails, accompanied by a natural decrease in the production of Bessemer steel ingots, and second in iron cut nails, which seem to be very rapidly going out of use. Apart from these two special interests, therefore, the year 1888 afforded a fairly good demand for iron and steel products.

For the first time the wire-rod production of the country has been ascertained. It appears that in 1888 the production of iron wire rods was 13,010 gross tons; of steel wire rods, 266,759 tons; total, 279,769 tons. The growing importance of this industry, however, would seem to entitle it to more space in the report than the brief paragraph in which these statistics are recorded. This is the more noticeable also from the fact that this business is now passing into the control of domestic manufacturers, and that we have nearly seen the last of heavy importations of rods. Rolling mills are now being erected in several parts of the country to manufact-

ure wire rods exclusively, so that the prospects are bright for a great increase in production this year over last year. And more mills of the kind are projected. What was once almost a lifeless industry is rapidly climbing its way to prominence.

But we did not start out to criticise this report, and have no intention to detract from its obvious merits in the least. We would like to make a suggestion, however, relative to tables of prices of iron and steel products. Philadelphia and Pittsburgh are time-honored centers of consumption of iron and steel, and should have a place in tables of prices. But the country has changed marvelously in late years, and other centers of iron production and commercial activity in iron have attained prominence. Cincinnati, Louisville, Birmingham, Cleveland, Chicago and St. Louis are iron centers whose prices move in slightly different orbits from those of Philadelphia and Pittsburgh. Their prices should also be preserved from year to year. The changes which have occurred merely in the past five years would form a very interesting study to many an iron manufacturer who has found his old markets slipping away from him. We would also like to make another suggestion, which occurs to us after reading the "General Review of the Domestic Iron Trade in 1888." The course of the demand for steel rails is no longer the key to the whole situation, although that was the case for years. During the last half of 1888 the market cut loose from the depressing influence of the poor business done in steel rails, and from the middle of July to nearly the middle of October a most excellent demand was experienced for pig iron, bar iron and a great many other iron as well as steel products, and prices were forced to a somewhat higher level. A study of steel-rail prices does not show this, of course, but a study of other prices would. Barring steel rails, the year 1888 was quite a good year for American manufacturers of iron and steel, some of whom even felt encouraged in September and October to advance their workmen's wages. We have no doubt that they would be very glad to have a continuance of the average of the first ten months. It may be strictly true that, as the report states, "the producers of Lake Superior and other domestic iron ores were more prosperous in 1888 than those who purchased their ores," but we would like to hear the evidence on both sides of this subject. The ore producers seem to be very positive that in 1888 they were the sufferers.

Hard on the heels of the estimates of the *Chicago Railway Age*, which were received very skeptically, come statistics compiled by the *Railroad Gazette* bearing on current railroad building. Our new contemporary makes the mileage of new track laid during the first quarter of the year 474 miles, against about 1000 miles in the corresponding period of 1888. This would indicate a total mileage of 3500 miles for 1889, against 7000 miles last year, if the same ratio be maintained. The *Railroad Gazette*, however, maintains that it is quite impossible to predict how much of the work now under way, aggregating 4221 miles in the United States, Canada and Mexico, will be carried forward during 1889. It is possible that it may be actively rushed, or that it may progress

very slowly. That will be determined by the success which projectors may have in perfecting their financial arrangements. A few weeks may change the situation in the money centers, and where hesitation and distrust now reign supreme eagerness and confidence may prevail. Thus far the outlook is certainly not promising.

#### Late Developments in the Russian Petroleum Regions.

Although Russian petroleum has not yet become a very formidable competitor of ours, it is good to watch what is going on in the Caucasus, this industry being pushed with great vigor and certainly giving astonishing results in many ways. Considerable discussion has been going on in Russia as to the advisability of laying a pipe line from Baku to the Black Sea, but although the capital for it has been in readiness for some time past, the Russian Cabinet is for the present at least opposed to the project, especially the Ministry of Communications. A considerable portion of the petroleum finds its way into the interior of Russia by ascending the river Volga; if, therefore, a pipe line should convey it almost exclusively to the Black Sea, the Government apprehend serious difficulties, most of the steamboats on that river, the factories on its banks and the railroads traversing the regions using naphtha as a fuel. The Government even intends to go further, and is making arrangements to have the residue utilized by the railroads subsidized by the State, hoping that they will then be run cheaper and that the saving will amount to millions of rubles. Besides, a fleet of steamers and lighters has been built for the conveyance of naphtha not only on the Volga, but on the Caspian Sea, and it would be ruinous for them if suddenly a pipe line were to take the bulk to the Black Sea. The latter region, moreover, is by no means dependent on that kind of fuel alone, inasmuch as it has within easy reach both Russian and Caucasian coal, and can import foreign without difficulty. A pipe line would be injurious besides to the interests of the Transcaucasian Railway—now conveying the petroleum—and the Government takes a special interest in seeing the same prosper. It even contemplates buying it. If the pipe line were laid now, at a time when the productiveness of the Caucasian oil region is not yet fully developed, Russian petroleum would soon be cheaper in Central and Western Europe than in the interior, while in the provinces watered by the Volga an insufficient supply of a cheap fuel would again lead to the destruction of forests, the very thing the men in power want to prevent.

Those taking a different view of the matter are of the opinion that the present owners of the Transcaucasian Railway or the Government, should it buy the line, can easily place the same in a position to defy any pipe line or lines. The number of tank-cars would have to be increased, the line be double-tracked, and this would coincide with the finishing of the Suram tunnel. They assert that the present freight rate of 16 copecks per pood could then be reduced to 10 copecks and yet leave a good margin, whereas the pipe applications for a concession are based on 11 copecks per pood. At 16 copecks the

railroad forwarded last year 32,000,000 poods of naphtha products, the pood equaling 36½ pounds American. As at the same time both the Persian and Central Asiatic trades are expanding—it is believed the Transcaucasian Railway will soon transport a good deal of merchandise in transit in that direction—the question arises whether Baku is in position to procure petroleum enough both for a double-track railroad and a pipe line, the more so as another railway line is projected—the Baku-Petrowsk-Rostow—which will also convey petroleum. Those who believe that sooner or later a pipe line will be laid in spite of the present Government opposition, the latter no doubt soon modifying its views in this respect, insist that production, not fully developed now, will soon become so exuberant that means will have to be found to get all the oil out of the way. Now, the pipe line would convey crude, and at its terminus on the Black Sea refineries would be erected. They seem to feel convinced that there will be oil enough to feed both the railroads named and one or two pipe lines. At any rate, the Government looks upon a pipe line as premature at present. In a couple of years those advocating it may nevertheless see their hopes fulfilled, and in some shape or another Russian oil may then be made to compete with ours in Europe.

We have reason to believe that work upon the Hudson River Tunnel will now be carried forward until it has been completed or else permanently abandoned. The rumors which have been circulated in the papers during the past few weeks concerning the raising of capital—\$1,500,000—in England to prosecute the work appear to be founded upon fact. We are not yet informed whether the plans formerly pursued will be adopted in the new work or not, but it is probable that operations will be prosecuted under the control of English engineers. The distance between the New York caisson and the Jersey City shaft is 5600 feet. The north tunnel has been finished about 1900 feet from the western shore and about 200 feet from the eastern shore, leaving a distance of 8500 feet yet to be completed before the headings of this tunnel meet. The south tunnel has been completed about 550 feet from the west and 50 feet from the east shore, leaving a length in that case of 5000 feet. No attempt has yet been made to provide terminal facilities at either end, the object all along being to first complete the submarine portion of the work and afterward lead the tunnel to an outlet in New York at the most desirable point. Land damages and traffic facilities, of course, will govern the selection to a great degree.

**Southern Freights.**—The Southern Railway and Steamship Association have issued a circular, under date of the 19th inst., announcing that on the 1st of May the rates of freight will be based on \$2.75 from Birmingham, \$2.25 from Chattanooga and \$2.50 from Sheffield to Cincinnati, \$2.50, \$2.25 and \$2.25 respectively to Louisville, and \$4, \$3.75 and \$3.75 respectively to Chicago. On the same date a special tariff on manufactured iron was sent out making the rates to Chicago 24 cents per 100 pounds from Birmingham and 22 cents from Chattanooga, 12 and 10 cents respectively to Cincinnati, 14 and 13 cents to St. Louis, and 11 and 10 cents respectively to Louisville, Ky.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 23, 1889.

The action of the appraiser at Philadelphia in classifying worsted cloths at the lower rate of duty, with woolen cloths at a higher rate, is the beginning of a policy of rigid construction on the basis of high duties by the Secretary of the Treasury. Under the rules of the Department it is customary for the appraiser simply to place his appraisal upon imported articles and refer it to the collector. The collector, however, is not compelled to accept the appraisal, but can go on collecting the duties the same as before. The collector at Philadelphia does not agree to the appraisal in this case, and is therefore disposed to collect the duty as heretofore, at lower rates. The appraiser was summoned to Washington yesterday, and explained the situation to the Treasury authorities. He was directed to return to Philadelphia and insist upon the collector forwarding the appraisal, so that the Department officers might have the question before them for a decision. Should the collector decline to forward the papers his removal will follow in a few days, as a Republican has already been selected for his place. It is probable that the collector will decline to comply with this exceptional proceeding.

There are several items in the iron schedule which have for some time been entered under a purely technical or forced construction of the law, which enables these articles to pass the Custom-House at a lower rate of duty. Not only will this be stopped and classification be made under a more rigid construction of the customs laws, but a general inquiry will be made respecting the assessment of duties on a number of imports of iron and steel, to see that the law is not evaded. The articles shall pay full duties and the American markets be protected thereby. It is evident that the Department is disposed to break up the system of technical construction of schedules and undervaluation as a means of facilitating foreign articles getting into the American markets.

The Secretary of the Treasury appreciates the fact that this Administration came into power on the sole issue of protection, and if there be any merit in high classification he proposes to take advantage of it and give the American markets full opportunity to reap the benefits.

The Treasury authorities have commenced to get the material together preparatory to the submission of certain tariff condumrums to the collectors of ports for investigation and reply. The Senate tariff bill, which is supposed to represent the most advanced ground of Republican ideas on this subject, contained certain defects which were to be corrected by the Senate. They will now be given trial in actual practice.

The controversy into which Senators Sherman and Quay have fallen over a question of patronage will prove a source of embarrassment to Representative McKinley, who was one of the prominent candidates for the speakership. The Pennsylvanians who have been circumvented by the Ohioans are now declaring that the 21 Republican votes of the delegation will be thrown solidly for Reed or for some Western candidate other than McKinley. The probability is that when the voting begins in caucus Representative Burrows will come up stronger than any of his rivals.

The correspondence received here from various parts of the country indicates that the prospects of large appropriations for additional vessels of the navy will greatly stimulate the iron and steel industry. It is claimed that an expenditure of \$10,000,000 a year in naval construction and

coast defense, which will create a large consumption of both iron and steel, will about cover the gap which usually lies between active markets and good prices and the unsatisfactory conditions of overstocked markets.

Secretary Tracy is giving attention to the study of naval construction. By the time Congress reassembles he will have before the President a comprehensive plan which will insure large and active Government purchases in the iron and steel market.

### American Society of Mechanical Engineers.

The Erie meeting of this society will be held Tuesday to Friday, May 14 to 17, inclusive. The selection of this place of meeting is a happy one, being in the center of a country teeming with appliances of interest to the mechanical engineer, and the study of which cannot but result most beneficially. The programme of the meeting contains topics of live interest, and is as follows:

First session, Tuesday evening, May 14, address by ex-President Horace See, followed by social reunion.

Wednesday morning session: Reports of council, tellers, committees and general business and professional papers as follows: Thos. S. Crane, "The Piping of Steel Ingots;" Henry R. Towne, "Gain Sharing;" Chas. H. Manning, "Comparative Cost of Steam and Water;" D. W. Robb, "The Old Locomotive 'Sampson';" James W. See, "Standards." At the evening session the following papers will be presented: Samuel Webber, "Notes on the Comparative Loss by Friction in a Transmitting Dynamometer under Different Loads and Speeds;" J. Burkhitt Webb, "Note on the Steam Turbine" and "An Error in the Encyclopædia Britannica;" Jas. E. Denton and D. S. Jacobus, "Steam Consumption by Engines at Various Speeds;" Jas. E. Denton, "Performance of a 35-ton Ice Machine."

On Thursday morning the following papers will be read: De Volson Wood: "Expansion of Timber due to Absorption of Water;" "Some Properties of Ammonia;" "Formulas for Saturated and Superheated Vapors," and "Some Properties of Vapor and Vapor-Engines;" A. F. Nagle: "Cornish or Double-beat Pump Valves;" A. W. Jacobi: "Improved Motion Device for Engine Indicators;" F. W. Dean: "Distribution of Steam in the Strong Locomotive" (supplement); Jay M. Whitam: "Cylinder Ratios in Triple Expansion Engines." The evening session will be given up to the following subjects: Scott A. Smith: "Belt Traction on Pulley Faces;" John H. Cooper: "On the Longitudinal Riveted Joints of Steam-Boiler Shells;" Lewis F. Lyne: "Bits of Engine-Room Experience," and "Kerosene Oil in Steam Boilers" (supplement).

Invitations have been extended to the society, through the local Committee of Arrangements, to visit the following places of interest: Stearns Mfg. Company Machine Shop, Erie City Iron Works, Jarecki Mfg. Company, Skinner Engine Company, H. F. Watson Paper Mill, Pumping Station of Water Works, Weschler's malt-house, Cleveland & Hardwicke Machine Shop, Ball Engine Company, and T. M. Nagle's machine shop. It is also intended to have a sailing party upon Presque Isle Bay and Lake Erie, at which time a visit to the pumping station and stand-pipe of the Erie Water Works will be made, and an exhibition drill will be witnessed at the Life Saving Station on Presque Isle.

Topical discussions, which have added so much to the interest of recent sessions of this society, will be continued at the coming meeting. The questions to be discussed are as follows:

What form of self-oiling boxes have you found the best for line and countershafting? Can you give figures as to economy of oil as compared with other methods?

What form of oil-cup or lubricator do you find most economical for use on machines requiring constant lubrication?

Have you any experience as to the use of machines for hand or power for facilitating foundry molding? Can unskilled labor be employed?

Is it right or wrong in theory to put a central support under the bed of engines of the Corliss type? Do you know of any bad results from its use or from its absence?

Does it prevent nuts from working loose or prevent breakage of bolts to reduce their cross-section between the head and the nut?

Did you ever meet with either of these cases? Did the unequal wear when a long slide works in short guides amount to enough to become objectionable? Did the unequal wear of a short piece working in long guides amount to enough to become objectionable?

Have you tried the plan of applying electro-motors to mechanical operations requiring not more than ten horse-power? Can you compare their convenience and economy with those of small engines or the usual transmissions by belting and shafting?

Is there any better plan to protect steel from corrosion than to japan it?

Have you successfully soldered aluminium? Can a luminium be welded by electricity?

Have you any experience in hardening machinery steel or in case-hardening it?

What are the relative advantages of the time-card and the time-book systems for keeping time in factories?

The usual arrangements have been made by the society for special rates for railroad fare to and from the convention. Full particulars will be furnished by F. R. Hutton, secretary, 64 Madison avenue, New York.

**The Connellsville Coke Trade.**—Advices from Pittsburgh are to the effect that the condition of the coke trade is steadily growing worse, the number of idle ovens now aggregating nearly one-fourth of the total number in the Connellsville region. Continued overproduction has resulted in a cutting of rates, with the result that sales have been made within the last few days at \$1 per ton, and it is hinted that bottom prices have not yet been reached. The operations of the 77 coke plants in the Connellsville region for the week ending on Saturday, the 13th inst., show 10,895 of the 18,266 completed ovens in blast and 2371 idle. Quotations are made as follows: Furnace coke, \$1.05; to dealers, \$1.15; foundry coke, \$1.25; crushed coke, \$1.50.

James Benbow Elliman, a prominent iron merchant and importer in Pearl street in the days before the war, was buried at Flushing, L. I., 18th inst. He was a native of Coventry, England, and 82 years old at his death. Mr. Elliman came to New York in 1831 as agent for Joshua Scofield & Sons, one of the largest iron houses of Birmingham. He afterward went into the iron business with his brother, forming the firm of Elliman Brothers, of 211 and 213 Pearl street, which continued in business until the breaking out of the war, since which time Mr. Elliman's life was spent in domestic retirement. He was the oldest life member of the St. George's Society, and was noted for the wide extent of his knowledge and open-handed hospitality and benevolence.

The Burden trial at Troy, N. Y., has been postponed until July.

### The New Steamer Puritan.

The palatial steamer Puritan, just completed for the Fall River Line, and which is expected to surpass in several respects her elegant consort, the Pilgrim, went on her trial trip last Monday to test her engines. Only the builders of the engines, Messrs. W. & A. Fletcher, a member of the Fall River Company and a few personal friends were on board. The Puritan went about 5 miles outside of Sandy Hook, a distance of 25 miles, and returned to her pier, covering the 50 miles in about five hours, or an average of 10 miles per hour. The machinery worked to a charm. This vessel is the largest in the line, and her estimated cost is \$1,500,000. Her hull is of steel, built on the double-hull, bracket-plate, longitudinal system, with 96 water-tight compartments. In addition there are six water-tight bulkheads, dividing the hold into seven water-tight compartments. She is supposed to be practically unsinkable. She is 403 feet long on the water-line, 420 feet over, or 30 feet longer than the Pilgrim. Her hull is 52 feet broad and 91 feet over the guards. The depth of her hull is 21½ feet, and she draws 13 feet of water when loaded. The interior of the steamer is finished in white and gold, and she has 350 staterooms, or 100 more than the Pilgrim. It is estimated that she can carry 1500 passengers comfortably. A single screw, driven by a compound beam engine of 7500 horse-power, propels the boat. The high-pressure cylinder measures 75 inches in diameter, with a 9-foot stroke, and the low-pressure 110 inches, with a 14-foot stroke. Her power is about 42 per cent. greater than the Pilgrim's. She has eight boilers, with a working pressure of 110 pounds to the square inch. The Puritan will leave for Newport the latter part of this week to receive her furniture and carpets.

The Eames Vacuum Brake Company, in their new forge shops at Watertown, run their hammers entirely by compressed air. The air is compressed by water-power. It is said that they find not only economy, but greater efficiency, in the use of air for this purpose than with steam. The air pressure is kept at about 80 pounds to the square inch, but if any specially heavy work is required it is quickly brought up to 100 pounds. The action is very quick and sharp, as the free exhaust causes no back pressure, and they are enabled to do with their largest hammer—10 x 28 inches—work that would require a larger steam hammer, using steam at the customary pressure. The compressor is placed in a separate building near the water-wheel. A reservoir is placed near the compressor to take the water of condensation, and another one is connected overhead with the hammers in the forge shop. Compressed air is also used for various purposes in the machine shop of the company. By the use of this compressed air in the hammer all trouble from condensation, which must be present to some degree with steam hammers, is avoided, and the shops are kept cooler without the heat radiated from the steam boiler, pipes and cylinders.

The entrance examinations of the Massachusetts Institute of Technology will be held at Boston and at a number of different points throughout the country on the 29th, 30th and 31st of May.

The Pittsburgh and Lake Erie and New York, Lake Erie and Western roads have announced the following new lake rates from Pittsburgh to Port Huron points, to take effect on the 15th inst: To Marine City, St. Clair and Port Huron, Mich., first class, 40; second, 35; third, 26; fourth, 19; fifth, 17; sixth, 14. Port Sandilac,

San Beech, Osceola, Ausable, Alpina, Cheboygan, Mackinac Island and St. Ignace, 60, 50, 36, 24, 22 and 20 cents per 100 pounds. The difference between these and the rail rates ranges from 5 cents to 1 cent on the different classes. Articles of iron and steel have been made fifth class in less than carloads and sixth class in carloads.

**Drilling Cast Iron.**—L. B. Brickenbridge, the instructor in mechanical engineering in the Lehigh University, has lately been making some experiments for the determination of the pressure exerted in drilling cast iron. He made a cylinder, in which was a plunger, having an area of 10 square inches. Three small grooves were turned in the plunger near its lower end, so as to prevent any leakage of the oil with which the cylinder was partly filled. Two holes were drilled in the cylinder near the bottom, and a steam gauge and an indicator were attached. The indicator cord was attached to the hub on the shaft of the quick return motion lever, in order to obtain diagrams of considerable length. When the piece to be drilled was resting on the plunger a diagram could be taken which would show the pressure exerted in forcing the drill through the work. With ¼-inch twist drill the greatest downward pressure was 400 pounds; with ½-inch, 900 pounds; with ¾-inch, 1100 pounds; with 1-inch, 1450 pounds, and with 1½-inch, 1800 pounds.

The American Society of Mechanical Engineers has changed its quarters from the Stewart Building to No. 64 Madison avenue. The change is desirable, because of the more central location of the new rooms and especially because of their more commodious arrangement. We trust that the society in its new domicile will continue to grow and increase its usefulness as it has in the old.

The New York Sinking Fund Board have approved the preliminary plans and specifications for the new criminal court building in Centre street presented by the sub-committee and ordered the committee to advertise for architects' competitive plans. The building will be five stories high and will occupy the whole block bounded by Centre, Elm, Franklin and White streets, just north of the Tombs. It will be fire-proof throughout, heated by steam and furnished with a sufficient number of elevators, and will be connected with the Tombs by a covered iron bridge.

New Birmingham, Tex., is coming into notice as a prospective iron center. While all sections of the State are spoken of as prosperous, the new town is especially vigorous. Myron C. Wick, manager of the large iron smelting and manufacturing firm of Cartwright, McCurdy & Co., of Youngstown, Ohio, and Robert Bently, the general manager of the Ohio Iron and Steel Company, of Youngstown, who were visitors there recently, expressed the opinion that the quantity and quality of iron ore surrounding New Birmingham, and the success of the State furnace at the penitentiary, were alone sufficient to insure a rapid growth in manufacturing enterprises.

On the 23d inst. Jacob Reese was granted a patent for which an application was filed June 27, 1879, and which, therefore, has been pending for nearly ten years. It is assigned to the Bessemer Steel Company, Limited, of Philadelphia. It covers the process of decarbonizing and desilicizing in a Bessemer converter, and subsequently dephosphorizing in a basic bath in an open-hearth furnace.

W. A. Conenay, of Charleston, S. C., has been elected president of the Bessemer Lands Improvement Company, of Bessemer, Ala.

Marville W. Cooper was appointed by the President Appraiser of Merchandise in the District of New York, on the recommendation of several dry goods merchants. He was a prominent candidate for collector under President Arthur, and is considered to be a very practical man.

Robert P. Porter, the editor and statistician, has received the appointment of Superintendent of the Census, and, besides a salary of \$6000, will have the disbursement of \$6,000,000 per annum.

David Harris, late assistant manager of the lower mills of Oliver Brothers & Phillips, Pittsburgh, was presented with a silver tea service by the employees of the mill on the occasion of his entering into partnership with Baldwin & Graham, stove manufacturers.

Henry J. Redfield, long connected with Morris Wheeler & Co., has associated himself with Ely & Ramsay, stove manufacturers, of Peekskill, N. Y., and 247 and 249 Water street, New York.

T. Guilford Smith is the Buffalo agent of Carnegie, Phipps & Co., of Pittsburgh and Beaver Falls.

James Forrest, secretary of the Institution of Civil Engineers, has sent to those of the American engineers who propose to visit the United Kingdom a list of the Reception Committee, formed exclusively of all members of all classes of the Institution of Civil Engineers. It includes the names of some of the most distinguished men in England.

Judge Kelley entered upon his seventy-sixth year on the 12th inst.

Thomas F. Rowland, proprietor of the Continental Iron Works, Greenpoint, has been ill for several weeks. It was Mr. Rowland who made the contract with Captain John Ericsson to build the ironclad Monitor, which had the famous fight with the rebel ironclad Merrimac. When he went to Ericsson to close the contract he said he would build her for 9 cents a pound. But Captain Ericsson said that not a fraction above 7½ cents a pound would be paid. This offer was accepted, though at a financial loss.

A telegram from Laurel, Md., says the Baltimore Automatic Transit Company have constructed there a circular track, 2 miles in circuit, upon which experiments are conducted. The system of propulsion is much the same as on the ordinary electric railway. The Edison dynamo and the Sprague motor are employed. The overhead rail is the main feature in the system, a double-flange wheel on the car and motor catching upon it when the train is in motion. The idea is to have stations 25 miles or more apart, supplied with dynamos of sufficient power to furnish electric force to drive the train for a round trip. The projectors of this enterprise expect to work a revolution in the carrying of mails and packages.

The Aqueduct Commissioners awarded to Charles W. Palmer a contract for the construction of the iron gatehouse at 135th street for \$6935, and to Cole, Wilcox & Co., for cast-iron piping at shaft 24, section A, for \$4000.

It is understood at the City Hall that Mayor Grant's rapid transit scheme has been killed in the Legislature.



# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 95 and 97 Washington street, CHICAGO, April 22, 1889.

The progress of the month is precisely in accordance with the gloomy predictions made at the beginning of it by leading members of the trade. The demand continues to diminish in nearly every line. Prices show comparatively little change, however, so far as open quotations are made, but there is reason to believe that these quotations would be generally shaded on transactions of any moment. Inasmuch as the prospects are very bright for an unusually active building season in this vicinity, the carpenters are threatening to strike for a uniform day of eight hours and a uniform wages rate of 35 cents per hour. Should the result be a cessation of building operations for any considerable time, the local iron trade will suffer in a direction which just at present seems most promising.

**Pig Iron.**—The market was very quiet during the past week, but one or two houses reporting anything like a fair trade. The jobbing foundries are melting much less than their usual quantity of iron, and the demand from this source, which constitutes a steady business in good times, has shrunk to small proportions. Consumers of Charcoal Pig Iron are asking in some cases to have deliveries on old contracts deferred from two to three months. There is consequently but a slight demand for Lake Superior Charcoal, and the indications are that if any large buyers were to come into the market concessions would be made on present prices. The Charcoal furnace men are resisting the downward pressure as much as possible, and, if the decision which some of them have made will be adhered to, the chances are against the sale of any considerable quantity at extremely low prices. A great deal of this year's make of Charcoal Iron will be piled to await better times. Southern and Ohio Irons have had a bad week again, only small lots of Soft Irons being called for. Bessemer Pig Iron has not been sold as such for some time. The price is nominally \$17, cash, but round lots could be had a trifle cheaper. Cash quotations are as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago Scotch, \$17 @ \$17.50; Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16 @ \$16.25; No. 2 Foundry and No. 1 Soft, \$15.50; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14.25 @ \$14.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

**Bar Iron.**—No class of buyers appears to have been in the field to any extent since our last report. Business has been unusually quiet. Prices of Common Iron are maintained at 1.60¢ @ 1.65¢, half extras, f.o.b. Chicago, for carload lots from mill, but sellers intimate that on good orders these rates would be cut very materially. Store trade is fair at 1.80¢ @ 2¢, according to quantity and quality.

**Structural Iron.**—Large orders for Beams were taken last week, and the usual complaints of slow deliveries are being heard with respect to contracts previously placed. The Beam mill of the North Chicago Rolling Mill Company is still shut down, the company having a good stock of Beams of certain sizes yet on hand. The demand for other classes of Structural

material is very light. Prices are unchanged.

**Plates, Tubes, &c.**—The boiler-makers report work very slack, with only a few contracts of any consequence in sight. Dealers in boiler material have therefore had a very quiet week. Prices are unchanged, the mills refusing to go lower than they have gone, and store prices still maintaining the usual schedule.

**Sheet Iron.**—Large buyers find Black Sheets fully \$2 ♢ ton higher than on the 1st of the month. The mills which were disposed to sell at cheap rates have taken contracts covering as much of their capacity as they deem safe, and there is now a decided feeling of firmness along the entire line. No. 27 Common is quoted at 2.95¢, f.o.b. Chicago, from mill, for early delivery. Very little Sheet Iron is now selling from store, and old prices continue—namely, 3.10¢ @ 3.20¢ for No. 27. Galvanized Iron is dull and weaker, but quotations on small lots continue at 65 % off for Juniata and 65 % and 2½ % off for Charcoal.

**Merchant Steel.**—A change for the worse has been made in this line, orders having fallen off quite abruptly. Prices continue nominally as previously quoted.

**Steel Rails.**—Orders for small quantities continue to be received with gratifying frequency by the local companies, but large orders are scarce, although a great deal of heavy business is in sight and only awaits the pleasure of capital. It is rumored that an 8000-ton contract for Michigan was taken at a very low price, but the figures which have been given currency are asserted by the sellers to be wide of the truth. Competition was very sharp, as the place of delivery is easily accessible from either Pittsburgh or Chicago, but it was not necessary to revert to the low price of last fall to get the order. For strictly Chicago business quotations are held at \$30 @ \$30.50.

**Old Rails and Wheels.**—The activity in Old Iron Rails which existed for quite a little time has been checked by the unwillingness of sellers to follow buyers further in the decline in prices. From \$20 to \$20.50 is now asked by holders, and buyers refuse to meet their views. The best offer made by Youngstown mills is \$21, delivered, with a freight rate of \$2.25 from this vicinity. The bulk of the Old Rails which were pressing on this market some time since has now been absorbed, and there is a firmer local tone. The demoralization of a week or ten days since has closed. Old Car-Wheels are very dull. There is now a surplus, which is constantly growing larger, and they are worth probably \$17 @ \$17.50.

**Scrap.**—Consumers seem to be so little in need of stock that dealers are largely refraining from offering it. A light business has been done in Cast at \$12.50 @ \$13, and Mixed Steel was sold at \$11 ♢ net ton. No. 1 Forge is worth about \$18, while No. 1 Mill has been well cleaned up, and would probably command \$18.50 @ \$14. Old Axles are to be had at \$23. Dealers continue to buy stock whenever it is offered to them at prices which would seem to afford them a margin. Some very large transactions have recently taken place in this way.

**General Hardware.**—The demand for Shelf Hardware is excellent, but it is not so strong as it was in March. It is expected to slacken up from this time on for a month or two. The Heavy Hardware trade continues very satisfactory. Wagon stock was in particularly active request, some concerns having done during the past week the heaviest business of the year in this line. With respect to prices, Screws are reported to be among the firmest articles on the list; Rivets are also firm,

but Bolts are suspected of weakness in certain directions, and Nuts have been quite demoralized. In Wooden-Ware a decline of 50¢ on Tubs is noted.

**Nails.**—A curious ruling of the Western Classification Committee puts Wire Nails in kegs in the second class, thus greatly advancing freight rates on them. It is believed that this is merely an error, which will be corrected when the facts are laid before the committee. The factories are having a fair demand from large buyers for both Steel Cut and Wire Nails, but without special feature, except that the Jefferson schedule on Steel Nails is being beaten by some of the competitors, and it is a difficult matter now to determine the prevailing factory price. Jobbers quote small lots of Steel Nails at \$2 and Wire Nails at \$2.40, with 5¢ off for mixed carloads.

**Barb Wire.**—The demand is more urgent than it has been for nearly a year. The manufacturers are so far behind in making deliveries that it is getting to be difficult for jobbers to fill their orders. The price is a little stiffer, but quotations are unchanged at 2.80¢ for Painted and 3.40¢ for Galvanized in small lots.

**Pig Lead.**—The market is again drooping and consumers are holding off in anticipation of lower prices. Sales of about 400 tons were made at and around 8.47½¢. At the close 8.45¢ was bid.

**Manufactured Copper.**—Although combination prices are still quoted, an indication of the future has appeared in the offers made to dealers of lots for future delivery at lower prices, with a guarantee against a further decline.

The removals to the Rookery Building, corner of Adams and La Salle streets, during the past week embraced quite a number of Iron and Steel firms, as follows:

Pickands, Brown & Co., agents for the Bay View, Union, Joliet, Dexter, Struthers, Wheeler and Crafts brands of Bessemer, Coke and Soft Irons and the Hinkle, National, Fayette and Leland brands of Lake Superior Charcoal Irons, and dealers in Iron Ore, Old Iron Rails and Old Steel Rails. They will occupy rooms 1007, 1009 and 1011.

The Calumet Iron and Steel Company, manufacturers of Bar Iron, Steel Nails, Fish-Plates, &c. They will occupy a suit of offices, with No. 519 as their general office.

George G. Spencer, sales agent for the Laughlin Nail Company's Steel Nails and the Aetna Iron and Steel Company's Bar Iron and Iron and Steel Plates and Sheets, and the Iron City Mfg. Company's Nuts. He will occupy room No. 556.

S. H. Fernandez, sales agent for the brands of Pig Iron handled by the house of Matthew Addy & Co., of Cincinnati, embracing Ohio and Southern Coke Pig Iron and Alabama Car-Wheel Pig Iron.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 23, 1889.

**Pig Iron.**—There is no special movement in the market at present, and in a general way things are just about as they were a week ago. The demand may be a trifle stronger, but with so many anxious sellers it is impossible to stiffen prices. All the same, the feeling favors improvement, and the conditions seem to warrant it. There is something of a scarcity of Bessemer Iron, and even a slight increase in the demand would be likely to affect prices of that class of Iron at once. As a matter of fact, it would not be very difficult to stiffen the entire line, with a very moderate increase in the demand, but while sellers continue drumming for bids

buyers feel no anxiety in regard to the future. The position to-day, therefore, seems to be that while stocks are light and prices low, the hesitancy of buyers and the urgency of sellers combine in keeping them low, and probably will continue to do so until the demand develops some degree of scarcity. It is impossible to say when this will occur, but as it is the unexpected that generally happens it may be so in this case. In any event it is not likely that much risk will be run in stocking up with good Iron at to-day's prices, although it is doubtful if that could be done to any extent without precipitating an immediate advance. Meanwhile business is being done at from \$17.50 to \$18.50, delivered at tide, for good to choice No. 1; \$16.50 @ \$17 for No. 2, and \$15 @ \$15.50 for Gray Forge. Southern (and some Western) Irons are being sold at 50¢ @ \$1 below these quotations, at adjacent points, and in some cases deliveries are made in Philadelphia at about \$14.50 for Gray Forge and \$17 for No. 1, but all depends on circumstances. What one might do under a little pressure is not accepted as any rule for another with a better Iron, or better situated financially. It is a waiting market, and as yet without any positive indications as regards the immediate future.

**Blooms.**—A tolerably fair business is being done in Steel, but there is no change in prices, and in actual transactions they depend a good deal on quantity, time for delivery, and requirements as to analysis, &c. In a general way quotations are about as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 1/2 "Bloom" ton of 2464 lb.

**Muck Bars.**—Business has been very dull during the past week, but prices are firmly maintained. There are buyers at \$26.50, delivered, but \$27 seems to be an inside figure for good Bars, and not many for sale even at that figure. Holders are a little timid in quoting for large lots, especially for summer deliveries.

**Bar Iron.**—There is a steadier feeling in Bars, based not so much on any particular increase in the demand as in the reduced supply locally, owing to two or three mills being shut down. Sellers are asking half a tenth more than they sold at a couple of weeks ago, and the chances are that the advance will be paid, as there is some probability of scarcity as the hot season approaches. Prices are miserably low yet, however, and the outlook far from encouraging, although, of course, the trade may jump into activity all of a sudden. There is some talk of large orders for cars, but so far there is nothing definite that can be given on that point. Prices for Bars are nominally 1.75¢ @ 1.85¢, and although there is a good deal of cutting on desirable orders, quotations are more nearly maintained than they were a week or two ago.

**Plate and Tank Material.**—The mills are all doing fairly, and there is a manifest disposition to ask more money on new business. A good deal of the activity is caused by the demand for material bought some time ago, and on which postponements had been asked. There is a pretty good demand, too, for new work, so that on the whole the Plate trade appears to be improving. Ship-builders have taken about 1500 tons during the week, and tank-builders nearly 500 tons, besides quite a number of orders of a miscellaneous character. Mills are full of work, therefore, until well toward midsummer; hence the unwillingness of sellers to duplicate some of their recent sales. Although firmer, prices are not notably higher, and are usually about as follows: 1.90¢

@ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 3 1/2¢.

**Structural Iron.**—While there is nothing specially new in the market, the feeling is better, and work at the mills more general than it has been for some time past. The outlook is decidedly encouraging in this department, and there is no reason to expect anything but activity for a long time to come, as large contracts are in hand or in prospect. Prices remain as before, viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2.05¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet Iron.**—The demand is about fair, and prices steady. Business to date has been about an average one, but as some large buyers have yet to place their orders, it is expected that the near future will develop greater activity, as there is already a good deal of inquiry. Meanwhile quotations remain about as follows:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, 1/4¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 1/4¢
Best Soft Steel, Nos. 21 to 24.....	3 1/2¢
Best Soft Steel, Nos. 25 to 26.....	3 3/4¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, 1/4¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67 1/2 %

**Steel Rails.**—The demand does not improve, and orders for Rails are confined mostly to small lots, although there is some inquiry for lots of from 2000 to 5000 tons each. The feeling among sellers is firm, and at the moment it would be difficult to secure concessions, as manufacturers appear to have a good deal of confidence in the ultimate course of the market.

**Old Rails.**—The offerings are small, but there is so little demand that prices have not been maintained. Several hundred tons of T's were sold at equal to \$22.50 Philadelphia, and they are now offered at that figure, with \$22 bid. The market is unsettled and prices liable to sudden changes, according to circumstances.

**Scrap Iron.**—The market is extremely dull, and prices are easier all around. Asking prices about as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The demand is improving and on the whole the feeling is much better than it has been. Prices are steady, with discounts about as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62 1/2 %.

**Nails.**—The demand is very much better, and the feeling in regard to prices is also more confident. Under forced sales, in large lots, low prices have been accepted, but for good brands \$1.80 @ \$1.85 is obtained for carload lots, and \$1.90 @ \$2 for lots from store. The comparatively small output, combined with the heavy demand, ought soon to put things in better shape.

The address delivered by Andrew Carnegie before the Legislature of Pennsylvania, entitled "Pennsylvania's Industries and Railroad Policy," has been issued in pamphlet form.

## St. Louis.

OFFICE OF *The Iron Age*, 212 N. Sixth st.,  
St. Louis, April 20, 1889.

**Pig Iron.**—A careful review of this department during the past week shows little change from previous reports. The volume of business is small and is daily growing less, and prices, which are at present at the lowest point, are weak and sensitive, and it is quite probable would be shaded somewhat on a good-sized order. Stocks are gradually increasing, and are likely to be thrown on the market at any moment, which, to say the least, will prove disastrous, at this period especially. Furnaces are generally disposed to make the best of things, but say there is very little in the outlook on which to base any calculation for early improvement, and say it requires considerable drumming to make what few sales are reported, as consumers seem to be very well supplied for the present, and concessions offer no inducement for them to become purchasers.

**Bar Iron.**—This department is in more or less of a mixed condition. Some mills report a heavy demand, while others are complaining for want of orders. It is reported that a local mill went into the market last week and took quite a number of orders at prices that cannot be met by the other mills with any profit to themselves, consequently the market is in a sensitive condition, and any movement either way is likely to influence its future course. Prices are weak and for small lots 1.75¢ @ 1.80¢ is quoted, and carload lots from 1.60¢ to 1.70¢, according to circumstances.

**Barb Wire.**—There is a gradual improvement in the volume of business during the past two or three weeks. Mills are all pretty well employed, and prices, while not quotably higher, show some signs of strength, and mills seem disposed to hold up prices, and it is intimated that some of the sales made the early part of the month could not be duplicated. Mills are quoting from \$2.80 to \$2.85 for Painted, and from \$3.40 to \$3.45 for Galvanized. Carload lots are quoted at from \$2.70 to \$2.75 for Painted, and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

## Cleveland.

CLEVELAND, April 22, 1889.

**Iron Ore.**—The first vessel load of new Ore reached Cleveland yesterday. During the present week not less than 50,000 tons will be unloaded at Lake Erie ports. Along with the first cargoes of new Ore has come a strong demand from buyers and several very fair orders have been placed. Minnesota Ores are going rapidly at \$5.75, delivered at Lake Erie ports. A large block of Chapin Ore, second quality, has been sold at \$5, and over 90,000 tons of Dunn Ore, at \$4, f.o.b. vessels Cleveland, Fairport and Ashtabula, has been disposed of. The Florence Mine has made heavy sales, but at such varying prices that it is difficult to give quotations. The Commonwealth Mine has disposed of about 40,000 tons of new Ore at \$4 and liberal quantities of Ore from the Aurora and Iron King have brought \$5.25. Quotations for all grades of Ore are based upon the established price for the output of the Republic Mine—\$5.75 per ton. Probably 150,000 tons of Republic Ore have already been sold. Orders are also reported for Chippewa Ore at \$5 and for Champion at \$5.75. Sales to date, including the Chicago consolidated steel companies' purchases, are believed to aggregate 1,250,000 tons. The Eastern furnacemen having been assured satisfactory freight rates from Buffalo to the furnaces, have already purchased 150,000 tons more

Ore than was unloaded at Buffalo last season. They are still in the market and promise to care for at 700,000 tons of Ore this year. Many new contracts for carrying Ore are reported to-day at 90¢ from Escanaba; \$1.10 from Marquette and \$1.25 from Two Harbors and Ashland. Quotations are as follows:

No. 1 Specular and Magnetic Ores, Bessemer quality	\$5.75 @ \$6.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	4.75 @ 5.25
Red Hematite Ores, Bessemer quality	5.00 @ 5.25
Red Hematite Ores, Non-Bessemer quality	4.00 @ 4.15
Menominee Range Ores, Bessemer quality	5.00 @ 5.25
Menominee Range Ores, Non-Bessemer quality	4.00 @ 4.10
Gogebic Range Ores, Bessemer quality	5.25 @ 5.50

**Pig Iron.**—The market retains all its discouraging features, in spite of which dealers refuse to believe that the hoped-for activity can much longer be delayed. Sellers have steadfastly refused to make additional concessions in order to force sales, and the few transactions reported have been at last week's quotations. The whole situation is so entirely out of harmony with the demand and prices paid for new Ore that the present depression is calculated to continue no longer than May 1. Sales during the past week have been too scattering and in too small amounts to warrant quotations of any reliability.

**Scrap Iron.**—Buyers still decline to give over \$21 for Old Americans, while Old Car-Wheels can be bought in liberal quantities at \$19.

**Nails.**—Steel Nails are still bringing \$1.90, but Cut Steel Spikes have declined to \$2.15. Steel Wire Nails at \$2.35 are in steady demand.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 22, 1889.

**Pig Iron.**—There has been scarcely enough business in Pig Iron in the local market during the week just closed to be a fair test of the prices current. The sales have all been small. The prices realized do not form a criterion for round lots for future delivery or even for near-by months. During the prevalence of such extreme dullness, however, there is a natural tendency for the market to sag, which disposition, however, may soon be erased by the occurrence of increased business. In the meantime new orders, though small, are being only secured by a sacrifice of, or rather by concessions in, prices. No. 8 Foundry and Mottled Iron show most weakness. At the same time, there is no pressure to sell round lots by either Southern or Northern stacks, although there is an indication of increased stocks. Producers adhere to their belief of an improved market during the latter part of the year, and the financially strong furnaces can well afford to wait for the favorable turn. With others, however, it may be a matter of necessity, but, apparently, all are inclined to sell as little as possible. On the other hand, buyers meet with little encouragement to make large purchases, and even when covering present wants they succeed in drawing the seller to them rather than otherwise, which gives them some advantage. Forge Iron continues to show less relative weakness than Foundry grades, but Mottled Iron has been sold lower. Car-Wheel Iron, too, is lagging, especially the lower numbers. The following are the approximate prices current here at the close, for cash, f.o.b.:

### Foundry.

Southern Coke, No. 1 (new classification)	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification)	14.00 @ 14.50
Southern Coke, No. 3 (new classification)	13.50 @ 14.00

Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 15.25
Mahoning and Shenango Valley	16.50 @ 17.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2	17.00 @ 18.00

### Forge.

Strong Neutral Coke	13.25 @ 13.50
Mottled Neutral Coke	12.00 @ 12.50
Gray Forge	13.00 @ 13.50

### Car-Wheel and Malleable Irons.

Southern Car-Wheel	20.00 @ 25.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.50 @ 21.50

**Manufactured Iron.**—The only feature of prominence has continued to be dullness, but there has been no change in prices.

**Nails.**—There has been an increased demand at the lower prices current. 12d @ 40d sell at \$1.90 @ \$1.95 per keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.45 @ \$2.50 per keg.

**Old Material.**—There has been very little trading in the local market in either Rails or Wheels, and while there is no pressure to sell there are no importunate buyers. Old Rails are quotable at \$20 @ \$20.50 and Old Wheels at \$18 @ \$18.50 per ton, spot cash.

Messrs. Talbott & Lupton, Iron and Steel factors, with offices at Nos. 1 and 2 Wiggins Block, announce that they will on May 1 remove to No. 8 of the same block, where they will have much more commodious quarters. They also invite attention to the fact that they are special representatives of the Roberts Wire Company, Belmont Nail Company and Hartman Mfg. Company.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, April 22, 1889.

**Pig Iron.**—While prices are low, Iron is certainly not a drug in the market. It is true that there is some piling up of stock at the yards, but nearly all the furnaces whose Iron has a reputation are disposing of their output at prices that are paying them some profit; and there is no intimation so far of any of them shutting down. Three large stacks in this district are out for the purpose of relining, but which, as soon as completed, will again go in, with a greater output than ever. There is much difficulty in getting an expression from furnace owners as to the future; and the probability is that but few of them have any opinion to express—only that they all intend to keep pegging away as long as they can get a dollar or two profit on a ton, which most of them say they can still do. Within the past few days there has been quite a disposition on the part of speculators to again enter the field, and quite a number of round lots are being piled up at the furnace yards. This no doubt gives an appearance of the furnaces piling up more Iron than they really are. Two of the Sheffield stacks have again gone in blast, and they state they have enough placed to go on for some two or three months at figures that are remunerative. The owners of the new plants that have been projected within the past few months, some of which have been commenced, are still sanguine of the future of the Pig-Iron industry of the South, and continue to put in their money; and they are going steadily forward in their construction, the owners arguing that there never was a cheaper time than now for the construction of such works, which is no doubt correct. The market is ruling at \$13 @ \$13.50 for favorite brands of No. 1 Foundry and \$12 @ \$12.50 for No. 2, in round lots, and about 75¢ higher for car lots.

## Louisville.

LOUISVILLE, KY., April 22, 1889.

**Pig Iron.**—The market has been quiet during the last week, with very little doing. Buyers of Iron have largely laid in supplies for the future. Offerings have not been heavy, as most of the furnaces have made contracts for several months ahead. The blowing out of one or two Southern furnaces somewhat relieves the pressure of the balance to sell. It, however, has not resulted in any increase in prices, as offerings are low and it is not generally anticipated that much improvement will occur in the immediate future. Prices remain about the same:

Southern Coke, No. 1 Foundry, new classification	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry	16.25 @ 16.75
No. 1 Mill	14.75 @ 15.25
Southern Car-Wheel, standard brands	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry	19.50 @ 21.00
Hanging Rock, Cold Blast	20.75 @ 22.75

Macfarlane & Mordue, of Louisville, Ky., successors to Kent, Macfarlane & Mordue, have now completed their arrangements for conducting a storage business in Pig Iron. Their yard is 150 feet front and 400 feet deep, situated on the line of the Louisville and Nashville Railroad, and enjoys the best switching facilities. Sheds and bins have been erected for the unloading and assorting of Scrap Iron, while the balance of the yard is used for the storage of Pig Iron. Two side-tracks extend into the yard, on which 20 cars can be accommodated, and Pig Iron can be unloaded or loaded from either side of them. Negotiable warehouse receipts are issued on all the material stored in the yard. Quite a quantity of Pig Iron has already been received on storage and a large lot of old car-wheels. The owners of the yard will in the near future put in machinery for cutting up old rails and scrap. Their city office is located in the Kenyon Building.

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, April 24, 1889.

The strike at the new Rail mill of the Allegheny Bessemer Steel Company still holds out, but thus far there has been no serious trouble, and the company have invoked the aid of the proper authorities, so that there is not likely to be any. It is evidently the intention of the company to make the mill non-union. Two of the leading spirits in the mill, Messrs. Park and Clarke, are at the head of non-union mills, the former with the Black Diamond Steel Works and the latter with the Solar Iron Works, both of which are operated by non-union men. It is, therefore, as already stated, the intention of the management of the new mill to make it non-union, and as they have had considerable experience in the way of strikes they have not gone into it unadvisedly or without counting the cost.

Some of the Monongahela River coal works have shut down, and it is expected that there will be a pretty general suspension within the next few weeks. All the down-river markets are overstocked, and not for years has the river coal trade of Pittsburgh been in as depressed a condition as at present.

The Iron wage scale is now renewed on the 1st of July instead of the 1st of June, as was always the time for adjustment until within the past year or so. Mill owners say they must have a reduction in order to compete with the cost where

skilled labor is so much cheaper; this will doubtless be resisted by the Amalgamated Association, and it is difficult to foretell what the outcome will be. As stated several weeks ago, some of the iron-workers favor a general shut down for a couple of the hot months, July and August, but whether mill owners will agree to this remains to be seen.

**Pig Iron.**—Dullness still rules, and, while hopes are entertained of an early improvement, the outlook in some respects is not as encouraging as it might be. Brokers say that not for years have they known business to be so dull at this season of the year. Some of our oldest furnace agents did not enter a single sale on their books during the week; and they are making but little effort to sell under present conditions. We understand that offers have been made to buy good brands of Gray Forge at \$14, cash, but thus far no sellers can be found under \$14.25, cash. Foundry Irons continue very dull, and there does not appear to be as much inquiry for Bessemer as there was a few weeks ago. Quotations may be fairly made as follows:

Neutral Gray Forge.....	14.00 @ \$14.25, cash
All-Ore Mill.....	15.25 @ 15.75, "
White and Mottled.....	13.00 @ 13.50, "
No. 1 Foundry.....	16.50 @ 17.00, "
No. 2 Foundry.....	15.50 @ 16.00, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal.....	24.00 @ 27.00, "
Bessemer Iron.....	16.00 @ 16.50, "

**Spiegel.**—Is quoted at \$29.50 @ \$30, cash, for 20 %, and Ferromanganese \$58 @ \$58.50 for 80 %.

**Muck Bar.**—There is some inquiry, but the market continues weak; we are advised of sales at \$26 @ \$26.50, cash, but few sellers as yet under \$26.50, cash. Makers claim that under the most favorable circumstances it is difficult to more than get a new dollar for an old one, and that if they happen to meet with an accident to their machinery they are out of pocket.

**Manufactured Iron.**—There is but little change to note in the condition of the market for Merchant Iron; demand continues light for the season, and prices are unsettled and unsatisfactory. We continue to quote upon a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2 % off for cash. Old-Rail Iron, it is said, is being sold by Mahoning Valley mills upon a basis of 1.50¢ for Bars. Skelp Iron, on which several of the mills are running full (one of them reports having orders booked sufficient to keep it busy until the 1st of July), is still quoted at 1.65¢ for Grooved and 1.90¢ for Sheared.

**Nails.**—There is no improvement to note in the Nail trade, and apparently but little prospect of any; only two concerns in Pittsburgh are paying any attention to Nails, and they are not working half time. We continue to quote full card rates, but it is possible that for a desirable order, of which there are very few offering, concessions would be made. It is reported from Wheeling that the Nail trade there is just as poor as it is here, and that an effort is being made there to have the wage scale reduced. Carnegie, Phipps & Co. are reported as pushing the Wire-Nail trade with considerable vigor, and there is no disputing that the Wire is to a considerable extent supplanting the Cut Nail throughout the whole country.

**Wrought-Iron Pipe.**—There is still considerable activity in large-size Pipe, and some of the mills have all they can do, but the smaller sizes continue very dull. The Standard Oil Company have placed some large orders within the past few weeks, and it is to be hoped that other buyers will make their appearance before long. The combination prices are being faithfully adhered to, which to manufacturers is encouraging. It may be stated that the combination rates are low enough,

and one object in keeping them low was that there would be less temptation to cut. Discounts on Black Butt-Welded Pipe 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Boiler Tubes, for 2 to 2½ inch, inclusive, 62½ % off; Casing, 5½-inch, 62½ % off; other sizes, 60 % off; 2-inch Tubing, 13¢ per foot, net; 3-inch Line-Pipe, 20¢ per foot; 6-inch do., 53¢; 8-inch, 90¢.

**Old Rails.**—Continue dull and prices are weak and drooping; sales of 650 tons reported at \$22.50 for American. There are but few offering, but the demand is light. Old Steel Rails are in fair request; Short Lengths quotable at \$17.50; Sale, 200 tons main track, long lengths, at \$20.

**Steel Rails.**—Heavy Sections are still quoted at \$26.50 @ \$27.50, cash, at mill, according to size of order, delivery, &c. The mill of the Allegheny Bessemer Steel Company, as noted elsewhere, is stopped in consequence of the men being on a strike.

**Railway Track Supplies.**—No change in prices. Spikes, 2¢, 30 days, f.o.b. cars at works. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

**Billets, Blooms, &c.**—Bessemer Steel Billets and Blooms are still quoted at \$27 @ \$27.50, cash, according to size, quality and delivery. Domestic Bloom and Crop Ends may be quoted at \$17.50 @ \$18.

**Old Material.**—Continues dull, hardly enough doing to establish prices. No. 1 Wrought Scrap, \$19, net ton; Wrought Turnings, \$18; Car Axles, \$24.50 @ \$25; Cast Scrap, \$14 @ \$14.50, gross; Cast Borings, \$11 @ \$12; Old Car-Wheels, \$19

## Detroit.

WILLIAM F. JARVIS & Co., under date of April 22, 1889, report as follows: While the market for the past week has been by no means dull, yet there seems to be a somewhat undecided feeling among buyers. Although stocks in consumers' yards are in most cases quite small, orders are placed only for limited quantities and for reasonably prompt shipment. Lake Superior Charcoal continues in fair demand, and some good sales of special brands have been made. Southern Irons are being offered at very low figures, and certain brands of Ohio Coke Irons are offered below prices asked three weeks ago. We quote for the present as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.50 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.50 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery..	18.25 @ 18.75

## New York.

Office of The Iron Age, 66 and 68 Duane street, New York, April 24, 1889.

**American Pig.**—The majority of sales agents and commission merchants report the market dull and, generally speaking, in an unsatisfactory condition. Current business is light, though in the aggregate it is up to that of last year. Consumers, however, are not buying more than to cover early requirements, and concessions would not apparently tempt them. Southern Irons are offering at \$16.75 @ \$17 for some brands, and it is probable that for some desirable orders lower figures would be accepted. We quote Northern standard brands \$17.50 @ \$18 for No. 1, \$16.25 @ \$17 for No. 2 and \$15 @ \$15.25 for Gray Forge. The latter would not probably fetch the lower price if any effort were made to press it for sale.

**Scotch Pig.**—The market is exceedingly dull, high cost making it difficult to

sell below our nominal quotations: Coltness, \$21.50 @ \$21.75; Summerlee, \$21.25 @ \$21.50; Langloan, \$21, and Dalmellington, \$20 @ \$20.50. Mahoning Valley Scotch can be laid down here at \$19.50 @ \$20, and deserves, as it is given, the preference.

**Spiegeleisen and Ferromanganese.**—The market is quiet. A block of 5000 tons of 20 % German Spiegeleisen has been offered at \$27.50 and could probably be bought at less. A lot of a little less than 1000 tons of Domestic 20 % Spiegel has been sold at \$27.75 at furnace. We quote Ferro. \$56 @ \$56.50, ex ship.

**Foreign Ore.**—The market is very quiet, little business being done, except an occasional cargo of Ore for the manufacture of Special Low-Phosphorus Pig. Such Ores as the Elba and Marbella sell at about 11¢ per unit. Freight is a little lower, say 15/6 from Elba, and 14 @ 14/6 from other Mediterranean and Peninsula ports.

**Structural Iron and Steel.**—A number of contracts for large buildings in this city are in the market. We continue to quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—One of the leading mills in the Pittsburgh district has withdrawn from the market at present prices. Other sellers are still very eager for business, however. Thus Steel Tank Plates have sold recently, for a moderate lot, at 2.15¢, delivered. We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3½¢ @ 4¢.

**Bar Iron.**—For large lots, Common is being offered at 1.55¢, delivered. The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Hoops.**—We note a sale by a mill in Central Pennsylvania of 1000 tons of Iron Hoops at private terms. We are informed, however, that the price was lower than Foreign Steel Hoops can be laid down for, although the latter are still lower than the domestic article.

**Steel Rails.**—Sales by Eastern mills have been confined to a few moderate-sized lots, among them one of about 5,000 tons to a Southern road, Savannah delivery, at a shade under \$27 at mill. In the West a Pittsburgh mill has secured the Louisville and Nashville contract of 15,500 tons at private terms, for delivery till May, 1890. We note also a sale of 1000 tons delivered at East St. Louis at \$29.25. There is some Southern business in the market, aggregating about 20,000 tons, including a 12,000-ton lot, which can probably be best reached by one of the Pittsburgh mills. We continue to quote \$27 @ \$27.50 at Eastern mill for fair-sized orders.

**Old Rails.**—Among the transactions reported is a sale of 1700 tons by an Eastern road to a Spike mill at \$22, New Haven. It is stated, however, that this price was paid as an inducement to secure an order for 2000 kegs of Spikes for the road selling the old material. We note also the sale of a few hundred tons of Old Rails to a Virginia mill at \$22 delivered, which it is reported netted the railroad about \$19, deducting freight. We quote \$22.50 @ \$23, nominally.

**Scrap Iron.**—This market is featureless and dull. Buyers' ideas of prices do not quite come up to those of sellers, who are accumulating stocks rather than make the concessions necessary to effect sales. Prices are firm at about the following figures: No. 1 Scrap, \$20.50 @ \$21.50,



for carload lots, delivered; Turnings, \$13 @ \$18.50, do.; Cast Scrap, \$15.50 @ \$16, do.; Cast Borings, \$9.50 @ \$10.

**Rail Fastenings.**—The market is weak and quiet, with Spikes selling, delivered, in normal lots at \$1.95 @ \$2 and Angle Plates at \$1.75 @ \$1.80.

**Cotton Ties.**—Business is quite active, with prices at \$1.10 @ 40-lb bundle, New Orleans delivery.

H. L. Waterman, Mills Building, is now the agent for the products of the Hartman Works of Carnegie, Phipps & Co., viz.: Cold Die-Rolled Steel, Merchant Steel, Steel Wire Nails and Copper Wire.

## Financial.

Centennial preparations and the Easter holidays have diverted attention from business to some extent, and among certain classes of traders the absence of expected buyers is interpreted as meaning that customers have deferred their movements in order to take advantage of low fares fixed for centennial visitors. It looks as if the first three days of next week are to be close holidays so far as this city is concerned. From one cause or another business does not altogether meet expectations, particularly as to the profits realized. Accounts from a distance indicate a seasonable increase of business at many points, although at Chicago "a particularly economical feeling" is said to exist in agricultural sections. The situation in Chicago, according to the *Inter-Ocean*, shows that "general business is unusually active in the city and the country tributary to that market. At St. Paul sales are said to be largely in excess of those of last year, the season being nearly three weeks earlier. Improvement in the lake regions will be more decided when advantage can be taken of lower rates for freight. Clearing-House returns from forty-two cities show an aggregate increase of 8.8 % compared with last year. In New York the gain is 8.8 %; outside of New York, 11.7 %. Boston gains 14.9 %. San Francisco, 11.9 %; Cincinnati, 4.2 %; Pittsburgh, 17.8 %; New Orleans, 20.4 %; Louisville, 24.1 %. Philadelphia, St. Louis and Baltimore decline moderately. The most important development of the week is the decision of the Interstate Commerce Commission, holding the Canadian roads strictly amenable to the Interstate law. As the provisions of the law can be enforced by a suspension of the privilege of transporting goods out of and into the United States again in bond, it is reasoned that the last grievance the railroads had against the Interstate law has disappeared. Crop accounts are good. Rains have fallen in all parts of the spring-wheat sections in the Northwest. A reduction of 50 % in freight rates between New York and Mexico has been made by the railroads from this city, making rates 65¢ @ 100 lb, against \$1.80 previously. Colonel Erhardt, the new Collector of this port, will assume the functions of the office on May 5.

The Stock Exchange markets were moderately active, transactions being confined to professional traders. The future course of prices is discussed with a wide variance of opinion. The very favorable bank statement had no influence. One feature was a fall in Hocking Valley, due to the bad condition of the soft coal trade. The volume of business done on the Stock Exchange on Tuesday was small, and as a rule prices moved within a narrow range. The interest of the day is centered in sugar trusts, gas trusts, Union Pacific and the stocks of other roads in the last-named system. The trust shares were quite active and displayed considerable irregularity. Union Pacific was sold by local interests,

but was bought by the foreign houses to a good aggregate amount. The bond market was a feature, particularly Reading generals.

United States bonds are quoted as follows:

U. S. 4½, 1891, registered.....	108
U. S. 4½, 1891, coupon.....	108
U. S. 4, 1907, registered.....	129½
U. S. 4, 1907, coupon.....	129½
U. S. currency 6s.....	121

The weekly statement of the Associated Banks showed a large increase in reserve, amounting to \$6,021,100, or 50 % larger than the week previous. This makes the surplus reserve now held \$12,067,210, against only about \$1,409,000 a fortnight ago. In loans there was a contraction of \$549,200. Specie increased \$6,537,300, and legal tenders \$1,106,600; deposits, \$6,491,200. The operations of the banks with the Sub-Treasury were the chief source of gain, amounting to about \$4,500,000. The currency movement was also in favor of the local banks. The extreme ease of money here and in Europe has stimulated purchases of lands by investors. The inquiry for short-time loans was insignificant, and the demand for longer dates was promptly met, the result being shown in the comparatively low rates of 3 % for 60 to 90 days; 3½ for four months, and 4 for from five to eight months. Commercial paper is in good demand and the supply is only fair. Rates are 4 to 4½ % for 60 to 90 day indorsed bills receivable.

The President appointed E. S. Lacey, a practical banker of Charlotte, Mich., to be Comptroller of the Currency. Exports of specie for the week amounted to \$692,000 and the imports to \$227,000.

The market for sterling is dull. The Bank of England rate was reduced from 3 % to 2½ %. The posted rates in New York are \$4.87½ @ \$4.89½. The liquidator of the Panama Canal Company made an unsuccessful attempt to borrow \$3,000,000 in London for the expenses of a survey and the maintenance of the canal works. His failure implies that within a few weeks the machinery along the canal will be abandoned.

The prices of commodities, excepting sugar and cotton, continue to droop. Breadstuffs were weak and lower again, on the influence of fair weather West and a month earlier wheat harvest than a year ago, according to advices from the Southwest, and as indicated by the heading out of the winter crop. This depressed the market daily, and even the visible supply decrease had no effect to rally the market. Corn was firm, on temporary scarcity, caused by the fire at the New York Central elevators, checking export demand. The export movement of provisions continues to be largely in excess of last year's. There is still an absence of inquiry for grain vessels to load at Atlantic ports. Sugar and cotton are higher. Coal is depressed. The Department of State is informed that the Canadian Government has continued the special rates of last year on the Welland Canal business.

The imports of merchandise at this port during the week were valued at \$9,083,000, of which about \$2,200,000 represents dry goods. Since January 1 the total is \$159,458,000, against \$155,438,000 for the same time last year.

The certificate of incorporation of the Edison General Electric Company was filed by Henry Villard and Thomas A. Edison and associates to carry out arrangements for consolidating the Edison Electric Light and Mfg. Companies. The capital stock of the company is \$12,000,000.

The Bureau of Statistics reports exports of breadstuffs for March to have been \$9,636,482, an increase of about \$350,000 over the exports for March, 1888. The total exports of beef and hog products for

March were \$8,125,068—an increase of nearly \$3,000,000. The exports for the five months ending March 31 were \$41,571,715—an increase of \$9,000,000 over the exports for the corresponding period of the last fiscal year. It is worth noticing that in exports of lard alone there was an increase during the month of over \$1,000,000 worth, and during the five months an increase of nearly \$4,000,000.

## Metal Market.

**Copper.**—Spot Copper declined in London since our last week's report from £37. 5/ to £36. 17/6 yesterday, and futures from £37. 10/ to £37. 5/; sales 1500 tons. One dispatch was received from Boston stating that in their negotiations with the parties in Europe the American representatives desired to fix the price of the metal at from £40 to £45, while the Rio Tinto people want it to be £35, and the bankers desire as much as £50; furthermore, that there are hopes of having the accumulated stock held for six months and the output curtailed. Another dispatch (from Paris, April 17) speaks of a stormy discussion that took place between the representatives of the Copper mines resident in London and a banking firm of high standing. The Bank of France, the Credit Foncier and Baron Hirsch are said to hold jointly 40,000 tons, the Banque de Paris 20,000, and other firms 50,000, and that the general public is of opinion such stocks cannot be realized except at a loss to the holders. A third message (Paris, April 19) announces that the shareholders of the Comptoir d'Escompte have filed the necessary number of shares to enable them to agree on a resolution legal in its effects at the general meeting to come off on April 29. Meanwhile, M. Moreau, the liquidator of the said bank, has proceeded to London in order to make an effort to get the same released from the guarantees given to English and American mines in support of the collapsed Société des Métaux. M. Moreau bases his hopes upon the decision of the Supreme Court in the "Terrencire Iron case" years ago. He thinks the present case of the Comptoir d'Escompte guarantees is identical with the Terrenoire case. Nothing has occurred in our own market pending these steps taken in Europe. Nothing has been sold in the open market of Lake Copper; casting brands are obtainable at 12½¢ @ 13¢. Electrolytic, guaranteed quality, has sold at 18¢. Parties interested in England have subscribed a couple of thousand pounds sterling to pursue the Comptoir d'Escompte directors and those of the syndicate personally.

**Tin.**—London improved for the week from £91. 15/ to £92. 12/6 yesterday, and futures from £92. 15/ to £93. 5/; sales 200 tons. The consumptive inquiry being light in our own market, and but little speculative inclination extant, sales were confined to a few small lots, 10 tons May, at 20.65¢; and 10 September, at 20½¢, spot ruling toward the close at 20½¢ @ 21¢, April being offered at 20.90¢, and May at 20.80¢, with 20.65¢ offered for both. The closing price of spot Tin in the open market is 20½¢ @ 21¢ at noon to-day. At the Metal Exchange to-day 25 tons July, 25 tons August and 25 tons September sold at 20½¢. Dealings outside of the exchange are active, the large metal firms having sold considerable quantities of Tin, chiefly for shipment. One leading concern has averaged in its sales about 25 tons of Tin per day. **Tin Plates.**—The Tin-Plate market has been sharing in the general dullness in metals, but, as stocks are light, and the markets abroad remain very firm, there is no giving way in prices. We quote,

large lines, ordinary brands, 3 box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.75; Ternae, \$4.12 @ \$4.30; Coke Tins, \$4.30 @ \$4.40, and Wasters \$4.15 @ \$4.20.

**Lead.**—Some 250 tons Common Domestic were sold at 3.67½¢, and 50 tons later on at 3½¢, the closing figure being 3.65¢, at which the market winds up languid, with hardly any disposition shown by consumers to stock up, as they have secured, it would seem, a sufficient supply to meet their next month's requirements. The West is flat at 3.40¢. At the Metal Exchange to-day 50 tons spot brought 3.65¢.

**Spelter.**—Has been quiet at 4.65¢ for Common Domestic, and Silesian at 5½¢ @ 5¼¢ nominally. The spring demand is evidently slow in coming forward. The metal is meanwhile devoid of features either way.

**Antimony.**—Has continued moving off steadily in a jobbing way at 12¢ Hallett and 13½¢ Cookson.

#### New York Metal Exchange.

The following sales are reported:

THURSDAY, April 18.	
10 tons Tin, May	20.65¢
WEDNESDAY, April 24.	
25 tons Tin, July	20.75¢
50 tons Tin, August	20.75¢
25 tons Tin, September	20.75¢

#### Coal Market.

The Anthracite Coal market is dull, with no alleviating features. The situation was the subject of a conference last week, with no further result than talk about advancing prices in June, but meanwhile circumstances bearing on the subject may naturally change. Cut rates among individual operators are quoted, and it is openly charged that prices are shaded by some of the larger companies. Production is still in excess of demands despite the efforts to restrict. The total exported for the week is 543,788 tons, against 506,662 for the previous week, and for the year since January 1, 8,391,700 tons, as compared with 9,809,700 for the same time last year. The official statement shows an output for March of 2,103,062 tons, as against 2,685,728 tons in the same month last year. Demands for manufacturing are on a lessened scale. Among recent contracts the following are reported: Supplies for the New York Board of Education, Talbot & Phillips, Staten Island Rapid Transit Road, Ward & Olyphant, Boston and Marine Railroad Company, Berwind-White Coal Mining Company. The West Point contract was awarded to Swords & Dickson at the following prices and discharge: Stove, \$4.28; Chestnut, \$4.23; Egg, \$4.03. The New Haven contract was divided between the Berwind-White Company, Pocahontas, Sterling Coal Company and J. C. Scott & Sons, at prices stated to be less than last year's.

There is a better inquiry for Coal at Eastern ports. The Connellsville, Pa., *Courier* says: "The Coke trade continues to fluctuate. Production and shipments still vary from week to week, but the general average is dropping slowly and steadily downward. Production for the past three months shows a steady decline. Shipments have fluctuated more, and the daily average for March is slightly in excess of that for February, though the production is *vice versa*. There does not seem to be any assurance of an improvement in the situation before fall, if then."

The Pennsylvania Railroad Company have begun the shipment of Coal from Harsimus Cove, opposite New York City.

The Delaware and Hudson Coal Company are to erect steam elevators on new docks building in deep water near Rondout Creek.

The Pennsylvania Railroad transported 200,000 tons of Coal during the week ended April 13, and the Reading reports 25,000 tons shipped to Port Richmond and Port Liberty during the week ended 20th inst.

#### Imports.

##### Hardware, Machinery, &c.

Auffmordt, C. A., Mach'y, cs., 3  
Batram Bros., Mach'y, pgs., 4  
Boker, Hermann & Co., Mdse., cs., 4; Arms, cs., 2  
Clark, G. A. & Bro., Mach'y, cs., 297  
Corbiere, Fellows & Co., Mach'y, pgs., 28  
De Witt Wire Mfg. Co., Mdse., cs., 6  
Erie Dispatch Co., Mach'y, cs., 22  
Field, Alfred & Co., Mdse., cs., 5; Anvils, 75; Hardware, cs., 15  
Folsom, H. & D., Arms Co., Guns, cs., 7  
Graef Cutlery Co., Cutlery, cs., 7  
Jones, Charles, Hardware, pgs., 10  
Marshall & Co., Mach'y, cs., 8  
Munoz & Esprilla, Mach'y, cs., 7  
Moeman, C. M. & Bro., Horse Clippers, case, 1  
Oastler, W. C., Mach'y, case, 1  
Overton & Co., Mach'y, cs., 5  
Pratt & Farmer, Hdwr., cs., 10  
Schoverberg, Daly & Co., Arms, cs., 3  
Sheldon, G. W. & Co., Mach'y, pgs., 19; Ironware, cs., 12  
Sanderson & Son, Mach'y, pgs. and pgs., 42  
Taylor, Thos., Mdse., cs., 13  
Terkinle, J., Iron Signs, cs., 29  
The Traders' Dispatch, Mach'y, cs., 15  
Wyman, Chas. & Co., Arms, cs., 12  
Ward, Jas. E. & Co., Stoves, 150  
Wright, Peter & Co., Machine parts, pgs., 52  
Wiebusch & Hilger, Lim., Mdse., cs., 49; Hwd., pgs., 14; Arms, cs., 1  
Williams & Whitney, Anvils, 28  
Witte, John G. & Bro., Cutlery, cs., 12; Needles, case, 1  
Order.—Mach'y, tons, 8; Guns, cs., 29; Mach'y, cs., 50; Hardware, cs., 6

#### Foreign Markets.

##### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.2
Florin (Netherlands)	19.2
Florin (Austria)	35.9
Wilets (Portugal)	51.08
Wilets (Brazil)	54.6
Mark (Germany)	23.8
Kilogram	2.205
Picul	134.

##### EAST INDIES.

PENANG, March 5, 1889.—*Tin.*—Receipts for the fortnight amounted to 5500 piculs. Europeans bought 2000 piculs, for the most part from Chinese dealers, who, besides, secured 7000 piculs. The market rose from \$36 to \$37.25, in order to close at \$36.70. During the first two months shipments to England summed up 22,493 piculs, against respectively 53,725 and 21,643 the previous two years. To the Continent there have been no shipments, but to the United States they were respectively 3112, 425 and 5467. *Exchange*, 3/0%.—*Schmidt, Kustermann & Co.*

SINGAPORE, March 12, 1889.—*Tin.*—Since the 26th ult. business has been very restricted. Small arrivals and a falling market in London have resulted in but a small business being done. The market opened at \$36.50, advanced to \$37.25, but closes weak again at \$36.25, sellers, but no buyers. This month's export will be moderate, and it is expected that the arrivals for some time will be on a more limited scale than they have been of late. *Gum Copal.*—The daily arrivals have fetched good prices, but in old stocks, which are large, there has been nothing done. *Gum Damar.*—Palembang of low quality fetched \$20.50 per picul. *Tonnage.*—Still more room offers from China, and rates per steamer to London gave way to 35/ for dead weight. *New York via Cape.*—The Edward Kidder has arrived, and will take up her engagements. *For Boston.*—The berth is vacant. *Exchange* has declined to 3/1% for six months' sight credit drafts. The exportation of tin from the Straits Settlements to the United States during the first two months has been 22,230 piculs, against 9846 in 1888, 12,866 in 1887, 14,715 in 1886, 4205 in 1885 and 9841 in 1884. The Dardanus took hence for New York 842 piculs, the Gulf of Guinea 1262 from Singapore and the Shannon, from here, 2843.—*Gillilan, Wood & Co.*

MANILA, April 15, 1889.—*Hemp.*—Has been nominal at \$13.50 per picul, against same date last year \$8.44, equaling 3/ ton, cost and freight, \$45.12 1/2, against \$30.2/6. The clearances for the United States since January 1 amount to 105,000 bales, against 43,000 in 1888; there remain loading for ditto 11,000, against 24,000;

there cleared for England since January 1 85,000, against 100,000, while there remain loading 3000, against 1000. Cleared for all other ports, 11,000, against 24,000; receipts at all ports since last cable, 14,000 bales, against 19,000, and since January 1, 200,000 bales, against 176,000 last year and 132,000 in 1887. *Freight*, \$7.50, against \$5. *Exchange*, six months' sight, 3/7, against 3/8.—*Ker & Co., per cable direct to their agent, Mr. Charles Nordhavs, 89 Water street, New York.*

COLOMBO, March 7, 1889.—*Plumbago.*—Business has been limited to a moderate export demand at the following quotations in rupees per ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Shipments since October have been as follows: To England, 54,901 cwt.; to Hamburg, 5418; to Antwerp, 5101; to Bremen, 659; to Holland, 437; to India, 63; to Australia, 88, and to the United States, 58,580; together 125,247 cwt., against 114,527 in 1888, 102,284 in 1887 and 81,546 in 1886. *Coir Yarn.*—Nos. 1 to 4 have brought 7 @ 12 rupees per cwt. *Exchange*, six months' sight, 1/4%.—*Volkart Bros. to their agent, Mr. John W. Greene, 82 Wall street, New York.*

#### AUSTRALIA.

MELBOURNE, Victoria, March 28, 1889.—*Iron.*—Although buyers have been holding back somewhat, more has been done, the inland trade being brisk. No. 26 Galvanized Iron brought £17. 12/6; No. 8 Fence Wire, £8. 15/ *Tin.*—Shipments from Australia and Tasmania footed up 375 tons for the fortnight.—*Per cable via London.*

#### GERMANY.

HAMBURG, April 13, 1889.—*Iron.*—The demand for Pig Iron remains so brisk in Rhenish Westphalia, with appearances of permanency, that more blast furnaces are contemplated; it is to be hoped that this may not eventually lead to overproduction. Spiegel has continued active and steady at 68. Forge Pig is without difficulty bringing 56.50 marks per ton; orders have been booked to October 1. Foundry Pig is moderately active. Bessemer is least wanted, at 58 @ 59; English do., 48/ on the West Coast. Both Thomas and Luxembourg have been sustained. Finished Iron is all the brisker since to the great home demand some for export is now added. Beams, though selling very well, begin to be turned out at such a rate that a reaction may sooner or later be unavoidable. Both Plates and Sheets keep up the same degree of liveliness, though advanced in price. The Wire branch has not yet recovered last year's activity. Cast-Iron Pipe foundries have now come to an understanding, so that there is an end to the ruinously low figures. Steel Rails have been sold to the Roumanian railroads at 102 marks per ton, delivered at Galatz; at home they are bringing 120 @ 125. The Dortmund quotations for Beams are 125 @ 128; Mild Steel and Bessemer, 145; Wire Rods, 114 @ 120; Steel Rails for mines, 110 @ 115.—*Borsenhalle.*

#### BELGIUM.

BRUSSELS, April 13, 1889.—*Iron.*—Opinions are divided about the desirability, from a general point of view, of the suppression of the import duty on Pig Iron; hence it is as yet doubtful whether the measure will pass. The Government collected for such duty last year 437,145 francs. In the Finished-Iron trade orders are being received at such a rate that it may be decided to raise prices. A good many of these orders are for export. As matters stand, the general outlook in the Iron trade is decidedly encouraging, the spring trade having set in earlier and with greater vigor than usual, with indications that the demand will not abate much in the summer.—*Moniteur des Interets Matériels.*

#### British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 24, 1889.

The metal markets have been quiet during the past week, partly because of the Easter holidays and partly owing to the absence of incentive to speculation. Block Tin, which sold at as low as £91. 10/ last week under pressure to realize, has reacted about £1, and now that the pressure is withdrawn the market is firmer, although quiet.

A considerable amount of Copper has changed hands at declining prices, with as low as £36. 15/ taken for Merchant

**Bars.** The purchases were principally by large speculators, there being little business with consumers. Holders continue to gradually realize.

The demand for Tin Plate has been less active, and prices have shown a drooping tendency the past few days. Makers, however, are in expectation of large orders soon, and yield very little, in view of the strong Iron market.

Business in all branches of the Iron and Steel trade has been moderate, owing chiefly to the holidays, but is showing more spirit at the close. Prices for common Sheets have advanced 5/8 ton, and 2/8 advance is asked for Blooms, Billets and Slabs.

**Scotch Pig.**—Business moderate the greater part of the week, but more active to-day. Prices are somewhat irregular.

No. 1 Coltness, f.o.b. Glasgow	55/
No. 1 Summerlee, " "	55/9
No. 1 Gartsherrie, " "	52/8
No. 1 Langloan, " "	55/9
No. 1 Carnbroe, " "	47/8
No. 1 Shotts, " at Leith	52/8
No. 1 Glengarnock, " Ardrossan	52/
No. 1 Dalmellington, " "	45/
No. 1 Eglinton, " "	45/
Steamer freights, Glasgow to New York, 2/6;	
Liverpool to New York, 10/.	

**Cleveland Pig.**—Trade rather slow in this branch, but the market very firm. No. 8 Middlesborough, G.M.B., 39/ prompt.

**Bessemer Pig.**—Quite large sales since the holidays, and prices strong at 1/ advance. West Coast brands, mixed numbers, 50/, f.o.b. shipping point.

**Spiegeleisen.**—There is a fairly good demand and prices remain firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

**Steel Rails.**—The market continues strong and inquiries are more numerous. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—More demand for these and higher prices asked. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—The demand good. Makers offer sparingly and ask higher prices. Bessemer, 2½ x 2½ inch, £4. 10/, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Sales moderate but prices very firm and held higher. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—There is no improvement in the demand, and prices are nominal. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap Iron.**—Small sales making at previous prices. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Tin Plate.**—The demand is irregular. Prices are showing little change. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/9
IC Bessemer Steel, Coke finish	13/6 @ 14/
IC Siemens " "	14/ @ 14/6
IC Coke, B. V. grade	18/ @ 18/3
Charcoal Terne, Dean grade	12/ @ 12/6

**Manufactured Iron.**—The demand has been brisk and prices are strong. We quote, f.o.b. Liverpool:

Staff. Ord. Marked Bars	£ s. d.	£ s. d.
Common	8 17 6	8 17 6
Staff. Bl'k Sheet, singles	7 15 0	7 15 0
Welsh Bars (f.o.b. Wales)	5 2 6	5 5 6

**Crop Ends.**—The market firm but rather slow. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Copper.**—There has been a fair business. The market barely steady. To-day's prices for Bars were £86. 12/6, spot; £87, three-months' futures. Best Selected, £45.

**Tin.**—The demand for consumption fairly active and prices firmer. Straits sold at £92. 10/, spot, and £93. 5/ for three months' futures.

**Lead.**—More doing in this metal, but prices show no material change. Quoted £12. 15/ for Soft Spanish.

**Spelter.**—The demand only fair, but prices firm. Quoted at £17. 12/6 for ordinary Silesian.

On Tuesday 18 non-union colored men were about to go to work at the Allegheny Bessemer Steel Works, where a strike is in progress, but were intimidated by a display of pistols and induced to leave.

Important changes have taken place in the management of the Tennessee Coal, Iron and Railroad Company. Judge Bond, until recently connected with Decatur enterprises, has become general manager. Fred. W. Gordon has charge of the furnace properties and is now pushing the Ensley plant. H. Duncan Wood & Co. are the fiscal agents in New York. It is probable that influential New York capitalists will take a large interest in the concern, whose policy will be considerably modified. The first effort is to be in the direction of improving furnace work, bettering quality and marketing product in a more conservative manner. It is probable that the company will first endeavor to accumulate earnings to create a large working capital. It has been suggested also that the Linn Iron Works, at Birmingham, be transferred to Ensley, the real estate being very valuable.

The Philadelphia Company have made a series of meter tests to show the consumption of natural gas in puddling in the McSweeney regenerative furnace, as compared with that of the common puddling furnace:

Style of furnace.	No. of heats.	Material.		Gas used per 240 pounds of muck produced while actually working.	Gas used per 240 pounds of muck produced through whole time.
		Charged pig.	Produced muck.		
Common, A.....	55	27,500	27,085	34,109	
Common, A.....	30	15,000	15,031	23,618	
McSweeney's, I.....	55	27,500	27,525	14,829	19,079
McSweeney's, I.....	55	27,500	27,125	13,529	
Common, B.....	88		42,180	80,000	58,650
McSweeney's, J.....	85	28,400	28,129	15,952	21,535
McSweeney's, J.....	52	24,900	24,069	12,100	18,200
Common, C.....	55	28,875	28,725		26,958
McSweeney's, K.....	55	28,875	28,180	13,719	
McSweeney's, K.....	55	28,875	27,885		14,746
McSweeney's, K.....	55	28,875	27,980		13,561
Common, D.....	50	25,000	24,325	38,996	53,850
Common, E.....	27	20,250	20,765	24,450	35,216
Common, F.....	55	27,500	26,888	34,588	48,144
Common, G.....	47	25,500	23,480	87,372	40,811

The trials were made at different times between December, 1887, and March, 1888. The Philadelphia Company own the right to use the McSweeney furnace in Allegheny County and are offering the use of the devices to all their customers.

The National Tube Works Company, McKeesport, Pa., report that they have sold over \$8,000,000 worth of their kalamined pipe since the patents were issued. This pipe is used for a variety of purposes, principally water, oil and gas. There are 5900 men at present in the employ of the above company, and their works comprise 60 acres under cover. The

daily output is 1000 tons of finished product, including standard steam, gas and water pipe, boiler tubes, &c.

### Treasury Decisions.

The following decisions have been rendered by the Treasury Department under appeals from assessment of duties:

#### WHITE BRASS DUTIABLE AS A MANUFACTURE OF METAL.

Representations having been made to the Department that certain white metal or so-called white brass, in pigs, costing in England from £105 to £120 per ton, is classified as a metal unwrought not otherwise provided for at a duty of 20 per cent. ad valorem, decides that said substance, which is known as "Parsons No. — white metal," is not the white metal of commerce, but is composed principally of tin (60 per cent.) and zinc (38 per cent.), with traces of lead, copper and other metals, and that it should be classified as a manufacture of tin, zinc and other metal and subjected to a duty of 45 per cent. ad valorem.

#### DUTY ON CROCHET NEEDLES.

On an appeal from an assessment of duty at 45 per cent. on certain merchandise claimed to be dutiable at 25 per cent. ad valorem under the general provisions for needles, the Department says: "From an inspection it appears that the merchandise in question consists of what are commercially known as crochet needles, consisting of an iron wire frame with three needles of different sizes attached to the end thereof, so that they may be folded within the frame, and with an accompanying metal case capable of being adjusted as a shield for the three needles and of being used as a rigid handle for the needles. The articles are in fact and commercially known as crochet needles, and therefore the claim of the appellants is sustained."

#### DRAWBACK ON BUCK-THORN FENCING.

On the exportation of galvanized fencing manufactured by the Buck-Thorn Fence Company, of Trenton, N. J., wholly from imported steel and spelter, a drawback will be allowed equal in amount to the duty paid on the imported materials used in the manufacture less the legal retention of 10 per cent. The quantity of the materials so used will be ascertained as follows: Allow for each 100 pounds of the fencing known as "Buck-Thorn" 107.3 pounds of steel and 12.6 pounds of spelter, and of the fencing known as "Forms No. 1" and "No. 2" 95.1 pounds of steel and 12.6 pounds of spelter. The affidavits of the proprietor and foreman will state, in addition to the particulars required by the General Regulations, that the fencing entered for export, and specifically described therein as "Buck-Thorn," or "Form No. 1" or "Form No. 2," was manufactured in form, and from the materials described particularly in the sworn statement of said company, dated February 5, 1889.

Private cable advices report that J. B. Haggin, who controls the famous Anaconda Copper Mine, at Butte City, Mon., has left Paris for London. Mr. Haggin is credited with being the one most difficult to please in the copper negotiations at Paris, and his departure is interpreted as a sign unfavorable to a possible "deal."

Emerson & Midgley, of Beaver Falls, Pa., who have been at work for two years developing the manufacture of wire belting, have now carried it to a point where they are prepared to do work on a large scale. They have shipped the main wire belt to drive the American exhibit at the Paris Exposition.

# Hardware.

With a view to obtaining direct from the trade accurate and detailed advices in regard to the condition of business and the prospects for the present season, we addressed inquiries to Hardware merchants engaged in both wholesale and retail business and situated in places large and small and in all parts of the country, asking them to report to us frankly the state of trade and its outlook. To these inquiries we have received a multitude of replies and a mass of valuable matter bearing on this question, so that we are enabled to give an especially full and reliable report concerning the Hardware trade in the different States. Our information coming from jobbing houses and retailers at many different points in each State enables us to take a more accurate and comprehensive view than could otherwise be obtained of the conditions existing in the different localities and the feeling of the trade in regard to business. The synopsis and condensation of these reports given below will be of service to manufacturers and merchants, as enabling them to judge intelligently as to existing conditions, and to frame their business policy accordingly. It is not feasible in one issue to cover the entire country in this review of the market, which will be continued next week, with a special reference to the South and West.

Our acknowledgments are especially due to our correspondents who have so courteously and intelligently supplied the data for this article.

## Maine.

The partial failure of the crops last season is being seriously felt in many parts of the State, and Hardware, as well as business in general, is reported as only fair and in some places rather quiet since the 1st of January. The farmers are, however, feeling in good spirits and will increase the acreage of the crops over last year, and with the early spring and generally good prospects for the season are feeling encouraged. In nearly all parts of the State the prospects for building and repairing are excellent, and at some places an unusual number of new buildings are being projected. Most Hardwaremen are carrying only average stocks, which in some cases are smaller than usual on account of the uncertainty in regard to prices and the fact that, owing to the lack of money with the farmers, a heavy trade was not anticipated during the opening months of the year. From some interior points we are advised that the Interstate Commerce bill bears injuriously upon trade, as, having no direct water communication, they have to pay the railroads for the long haul. Collections from the farmers are reported slow but from Hardware merchants fair. A hopeful feeling pervades the reports from this State.

## New Hampshire.

A satisfactory condition of general business is reported, and Hardware generally is referred to as in good shape, with a good regular demand without special features. Well-assorted stocks are carried without special curtailment on account of uncertainty in regard to prices, and the outlook is regarded as favorable. Our advices in regard to the movement of building throughout the State are not as full as we could desire, but they indicate that there is a fair activity in this respect. The early spring has a favorable effect on business, and little complaint is made about

collections, though they are evidently rather sluggish.

## Vermont.

Our reports indicate that Hardware as well as business in general is somewhat dull, the condition of the roads in some parts of the State militating against an active trade. Stocks of Hardware are fair, and despite very low prices, which have a tendency to become lower, are purchased on the hand-to-mouth principle. Prospects generally for trade the next few months are good, with about the usual amount of building. Agricultural conditions are not satisfactory, there being some complaints of dry weather. Farmers as a rule are not disposed to buy beyond their absolute needs, and are slow in making payments, collections being thus unsatisfactory. One of our correspondents remarks that "good crops and better prices would improve trade very much. There's no end of things the farmer needs if he could only get money to buy with."

## Massachusetts.

The reports from this State are in the main satisfactory and indicate a good business during the season thus far, with very fair prospects for the summer. General business during the winter has been in the main about equal to former years, and the Hardware trade has been up to the average, being reported in many towns as good, although from some points the complaint is made that it has not started in with the opening of spring as vigorously as was expected. In many places there is an excellent prospect for building, but in some the question as to the hours of working introduces an element of uncertainty. Many additions to factories and the establishment of new manufacturing concerns are reported, and in some representative towns the prospect for building is referred to as never having been better, and in others as better than for several years past. Stocks of Hardware are fair to large, the condition of business justifying the keeping of good stocks, while the unsteady state of the market has prevented dealers from buying largely. Little complaint is made in regard to collections, which from some points are reported as very good and in others as rather slow. Farmers do not seem to have much ready money, the winter having been for them rather unfavorable.

## Rhode Island.

Most of the manufacturers are doing a fair business and making a large quantity of goods at small margins of profit. From Providence our reports indicate that February and March were quiet but that trade is now improving, and Hardware is moving in an average way but at low prices. Stocks throughout the State are not large, but well assorted, merchants being careful to avoid overstocking on account of their feeling that prices are not firm. It is gratifying to observe that from nearly all points our reports indicate a prospect for a fair amount of building and the expectation that trade for the season will be fair. Lack of promptness in collecting is to be noted.

## Connecticut.

During February and March trade was generally quiet, beginning to show increased activity with the advance of the season. From some points there are indications that with warmer weather there will be an improved business, but other merchants do not take so hopeful a view of the situation. There is a general recognition of the weakness of prices, and the tendency toward the coming together of manufacturers and consumers is referred to as embarrassing dealers and gradually reducing the margins. Comparatively few towns report as much building as usual, but from some there are

indications of more than the average. Collections have been slow but are improving, as the country trade is starting, but it is necessary for merchants to push them in order to keep them up to the mark. There are a number of new industries being started in several places which are stimulating local trade.

## New York.

Advices from the trade throughout the State indicate that there is about an average business in trade generally and that Hardware is similarly situated. Jobbing houses in the interior report a considerable volume of business, especially in heavy goods, in which the margins of profits are small, and also in seasonable goods, which are moving freely, while the trade on General Hardware are ordering sluggishly and are careful not to exceed their near requirements. In a number of places the indications point toward a good deal of building, and there is an apparent disposition on the part of those possessing means to put their money in real estate, and accordingly in many places the outlook for building is referred to as especially good, with the intimation that small and comparatively inexpensive houses will have a prominent place. Merchants are generally buying carefully and carrying as small stocks as possible, on account of their apprehension that lower prices may rule; and it is evident that stocks of Hardware are below rather than above the average. There is nothing discouraging in the outlook for the business of the next few months, and as the trade have been buying cautiously and are carrying light stocks it is anticipated that with fair crops a good business should be done. Nothing special in regard to collections is to be noted, there being some complaint, with the indications, however, pointing to about the ordinary conditions. From a representative wholesale house in Central New York we have an exceptionally full and satisfactory report, from which the following extracts will be of interest:

General business seems to be about the same as last year at this time, if anything a little duller, particularly the city trade. The Hardware business was better in January, poorer in February and better again in March than in 1888. Prospects for the immediate future are fair, and we see no reason to expect a much better or a much poorer trade than we had last year. Retailers' stocks are generally considered small, or at all events not above the average. In this city there is much building of small houses on loan-association funds, but no large contracts are made out. Collections are only fair. We take much paper, but our trade is generally solvent. The crop of last year was a fair one, but prices ruled so low that the farmers have little money to start this year with, and this will tend to restrict trade.

## New Jersey.

This State reports a steady and satisfactory trade, with the differences as to volume and tone which are to be expected in different localities. Building is generally referred to as active, most of our correspondents referring to their localities as likely to erect more than the usual number of buildings during the present season, and one of them remarks that this appears to be about the only way in which capital can be made use of. There is accordingly an improved demand for Building Hardware, in which line there is a fair activity. Stocks are about as usual, in most cases being kept up well, but the proximity to the markets justifies many of them in carrying comparatively small quantities of goods. While the general situation is thus satisfactory, it is evident that there is not much life in trade, and the low and uncertain prices have their effect in checking purchases, so that travelers in many cases report business as comparatively quiet. The disposition of manufacturers to deal direct with consumers is referred to as one of the annoyances with which the trade have to contend.



**Maryland.**

Our reports from this State are not as numerous and comprehensive as we could desire, but from those in hand it is evident that Hardware, as well as general business, is not in a satisfactory condition. Stocks of Hardware are apparently only adequate to requirements, no overstocking being perceptible. Prices are low, with no visible tendency to advance. Collections are only fair. We give the following advices from a prominent Baltimore house, which will be of interest as reflecting from their standpoint the condition of the market at large:

From all that we can learn as to business in general it is characterized throughout the country by a lack of activity, and where extra efforts are made to force trade and stimulate a demand for goods which does not naturally exist the cost attending such efforts is so great that the net profits are most unsatisfactory. We do not believe that the stocks throughout the country are in excess of its needs, but with the facilities of replenishing so easily when exhausted there is not the necessity nor the disposition for the trade to buy as largely as in former years. Regarding prices we can hardly believe it possible for lower figures to be reached than now prevail, except it be with such goods as are held in combination or pools. We believe that generally the condition of the agricultural section is as good financially as ever at this season of the year, which means that if the fruit escapes the frost, the wheat the rust, the corn the worm, the cotton the drought and the stock have grass enough, the farmer may be able to pay his store bills from the growing crops. Little money can be expected from the cotton States until next fall, though we suppose general collections are about as usual. We think for such goods in our line as may be considered necessities the demand will be fair, though economy may be shown in building.

**Pennsylvania.**

General business since the 1st of January is from nearly all points reported as fair, there having been in some sections a falling off within the last few weeks. Hardware is moving in fair volume, but there is no snap or activity in business. In the coal region trade is referred to as quiet. Stocks are generally well assorted and in a number of towns are reported as large, but there is no general disposition on the part of the trade to speculate, and owing to the unsettled condition of the markets goods only for immediate requirements are carried. Our correspondents generally refer to the downward tendency in prices. Agricultural conditions are favorable, the outlook for the growing crops being good, while it is, however, too early to predict confidently. Prices of country products have been exceedingly low, owing to overstocked markets, and the trade feels the effect. In nearly all parts of the State the prospects for building are, however, excellent, and from Philadelphia, Pittsburgh, Reading and other points this feature is referred to, with the intimation that it is better than for several years and that many dwellings and some fine business houses are in prospect of erection. There is a good deal of diversity in regard to the view of the trade as to collections, such points as Philadelphia and Pittsburgh reporting them fully up to the average, and with but little cause for complaint, while smaller points, where there is more direct contact with country trade, report them rather slow.

**Ohio.**

The reports from this State are gratifying, and it is evident that compared with the condition of things in other States Ohio has little reason for complaint. The volume of general business compares well with last year, but from some points it is referred to as rather quiet, with a certain feeling of depression. Most of our advices indicate that the Hardware business is satisfactory in volume, though perhaps showing some falling off from last year's figures. The large jobbers generally refer to trade as good, but reports from the

smaller jobbers are not quite so encouraging. The tone of the reports from retailers in different parts of the State is in general well represented in the following, which comes from Springfield, though, of course, in different localities there are special conditions affecting the situation:

In a general way trade has not been for the new year as large as was looked for, nor what it should be after the general slowness during 1888. The Hardware trade in particular is an exception. There has been a general increase since the opening of the year in sales and in confidence for the future. Small stocks, as a rule, are carried, and less buying ahead has been done than for some years. Prices are being better held than for some time by both jobbers and makers of goods with the exception of some few leading articles, such as Nails, Strap and T Hinges, Wire, &c. The prospect for trade for the months to follow is good. Shops are running full force. The farmer is in hard luck, with low prices for his product and an exceedingly small demand for what he brings to market. Collections are much better as a rule than for the same time a year ago, with more ready cash paid for goods.

While reports from other points are not in all respects as gratifying as the above, there is general agreement that the outlook is encouraging, our correspondents, with scarcely an exception, referring to the prospect for trade the next few months as promising. The amount of building throughout the State will evidently be up to the average, but the low prices ruling for farm produce will diminish building through the farming sections, but it is probable that the anticipated activity in towns and cities will more than make up for this. While there is some complaint in regard to collections as a little slow, and in some cases as decidedly so, it would appear that as a rule they are fully up to other years.

**Kentucky.**

Our advices from this State indicate that an excellent condition of things prevails, and there are some evidences of improvement over last year. General business is fair and the early spring has a stimulating effect upon it. Hardware is up to the average and there is at present a good demand for goods generally, but Iron is rather dull. The stocks in the hands of retailers are fair, but not heavy. There has been no buying of a speculative character for a long time and consequently stocks are light, but well assorted. Notwithstanding the good volume of business prices are low and this fact has the effect of deterring the trade from purchasing beyond their requirements. The prospect is regarded as good for a steady trade, with good prospects for building, as many dwellings, especially small dwellings and other buildings, are under contract. Collections are in rather better shape than usual. The crop prospects are regarded as excellent. With reference to general conditions a correspondent writes:

Competition for trade is closer than ever and profits much reduced. The year past has been one to make both manufacturers and jobbers scan expenses more closely, with a view to reducing the same.

**Michigan.**

During the early months of the year business was quiet and rather depressed, and with this condition Hardware naturally sympathized, but with the approach of spring there has been a marked improvement and our advices generally report a satisfactory business, to which, however, there are some exceptions, as other merchants refer not only to the trade of the past six months as having been the poorest in years, but also allude to the opening of spring as bringing only a slight improvement. Such reports, however, do not represent the general tone throughout the State, as many merchants are doing a good business, with stocks that are fairly well assorted and in some cases large, as the low prices induced free purchases. Farmers generally are without much

money, and the decline in wheat has a depressing effect. A good crop, which is indicated at the present time, will do much to induce a very satisfactory business. Stocks are fully up to the average and well assorted, and in some cases large, as travelers have been persistent and prices cut. A general tendency, however, to buy often and in small quantities is noted. The general downward tendency in prices is recognized. In some parts of the State the prospects for building are good, but in others there is little enterprise in this direction, and reports generally indicate that there will not be as much building as last year. The present indications point to a good season for agricultural products, as wheat came through the winter in excellent condition and looks promising, while the mild weather and early spring have an encouraging effect on the farming community. Few merchants report collections as good, most of them referring to them as slower than usual or only moderate. From a well-known house in Detroit, doing principally a retail business, we have the following:

Our trade is better this spring so far than it was last year or the year before, and we do not know of any reason why it should not continue. We are aware that the Hardware trade generally complains of dull trade. Stocks of Hardware, we believe, are generally small. We have bought largely this spring ourselves, as we consider the general lines good stock at prices which we think are down at bottom. Building prospects here are good and we consider the agricultural condition all right. Collections are about as good as usual, and we do not see why business for 1889 should not be better than any of the last three or four years.

**Indiana.**

General business is fairly active, but to a certain extent the partial failure of the wheat crop last year has affected it. The excellent prospect, however, for crops the present season induces a hopeful feeling, and there is little ground for complaint in regard to the volume of business. Most of our reports reflect a good condition in the Hardware trade, but it would appear that business is somewhat better in the Northern than the Southern part of the State. Several of our correspondents allude to their sales this spring as comparing well with those of last year. Full stocks are generally carried and well assorted, but the trade are buying carefully and in such quantities only as are required for their business, without much disposition to buy beyond their near requirements. Prospects for building are good, and it is probable that the amount of building will be somewhat above the average. Collections are only fair, but show some improvement during the last 30 days. Other points in regard to the condition of business are mentioned in the following careful review, which applies more or less accurately to conditions in the State generally:

Since January 1 business has been quiet, owing to the almost entire failure of the wheat crop last year and the low price of corn and cattle, and Hardware, in sympathy with other lines, is dull. The depression, however, does not seem to have affected the solvency of dealers to any extent. The stringency has had the effect with most dealers to reduce stocks, and as a consequence stocks are light though well assorted. The prospects for a fair summer and fall trade are good, and there are more buildings in progress and in contemplation than usual. The early spring weather has been favorable for the growing wheat, which now promises an abundant crop. The preparation of ground for corn-planting is well advanced and a large acreage will be put in. Tax-paying time is keeping back collections, which through the season have been fair. The general impression is that there is a strong conservative feeling existing among the Hardware trade of this vicinity, and they are carrying out this sentiment by buying often and in smaller quantities than usual.

Another correspondent writes:

Salesmen traveling in the Northern part of our State are generally having fair trade,

while in the Southern part they report trade quiet. Farmers are holding meetings to oppose the high price of Binder Twine, and frequently implicate local dealers as being instrumental in maintaining these prices.

#### Illinois.

The low price of produce and cattle has a certain depressing effect on the markets, and business in general does not vary much from last year's volume, and is reported by many merchants as being somewhat better, and some of them refer to the demand for Hardware as having been exceptionally good. There are, however, others who find it rather quiet, but this is not the general tone. Our correspondents, with scarcely an exception, refer to the prospect for the summer and fall as being very gratifying, and their anticipations are based on the general activity in business, the prospect of at least the average amount of building (the outlook for which is especially good in the large cities) and the expectation that the crops will, as at present indicated, be good, if not large. These conditions, together with the fact that retailers generally are carrying only moderate stocks, and are usually in good shape financially, though experiencing some difficulty in making prompt collections from their customers, induce a hopeful, if not confident, feeling. Chicago reports a very satisfactory business, and trade during the season has been active. As reflecting conditions in central Illinois we give the following synopsis of advices from a well-known jobbing house in the interior:

We have sold 30 per cent. more, according to the footings of our sales up to January 1, than during the same time last year. Stocks of Hardware are better than they were the first half of 1888, but the dealers generally have gotten so much into the habit of depending on the jobbers for supplies that there are no large stocks carried. Staples are sold on as close margins as we have ever known, but the profit on other goods is better than usual. The prospects for trade during the next few months are the best we have had in several years, and the outlook for building is excellent. We have a few chronic slow customers, but the balance of them seem to have money enough to meet their obligations.

#### Wisconsin.

Business in general in this State has been disappointing and lighter than usual. The condition of the Hardware business is not satisfactory, but in some sections of the State the prospects for the next few months are referred to as fair, while still others anticipate a trade exceeding that of last year or the year previous. Building prospects are only fair, though they are reported good from two or three points. Stocks are light and in some cases well assorted. Prices rule very low, owing to excessive competition, and are regarded by some of our correspondents as at bottom, which leads them to a hope that an advance may develop. The condition of the crops is generally referred to as unsatisfactory, leaving farmers with but little money, which injuriously affects trade and makes collections slow. Traveling salesmen report general sluggishness. We append a few extracts from the report of a well-known wholesale house:

The volume of business in this vicinity for the past eight months has been lighter than for 25 years during the same months. Hardware business has been even lighter than general business. Stocks in the hands of retail dealers are unusually light. Most staple articles are lower than ever known before. This is especially true of Iron and Nails and Barb Wire. Prospects of building are not flattering. No building of any consequence of the better class, houses erected being mostly of the cheaper kind. All through this neighborhood the hay and grain crop of 1887 was a failure and the grain crop for 1888 was light, very seriously affecting business and making collections very slow. Traveling salesmen say that business is light and must continue so until after a good general crop.

#### Iowa.

The tenor of reports from this State is satisfactory, indicating a fair to good business, with an excellent outlook. The

crops last year were good and promise well this year, the spring having been unusually favorable for agriculture and the prospect for large crops excellent. Indeed, one of our correspondents calls attention to the over-abundance of the crops in these terms:

In fact, we raise too much on an acre of ground in this State—too much corn, too much oats, too much potatoes, too much beef. All the above articles are sold too cheap. It takes about 7 pounds of beef to purchase 1 pound of Binder Twine.

The low prices thus ruling naturally affect business, but the volume of trade is evidently up to the average, as indicated by the following reports on this point, which are selected at random from those we have received:

The Hardware business is very good. A large demand for goods in this [Burlington] region. Very good during February and March, but light the first two weeks of April; but we now look for very nice business, recent rains having revived farmers' prospects. For three months ending April 1 not as satisfactory as desired, owing to very low prices ruling for farmers' produce of all kinds and the absence of rain. Since April 1 trade much improved; quiet, but looking up; healthy generally.

Stocks are kept up sufficiently to meet the wants of the trade, with no disposition to carry large stocks for speculation. They are generally reported well assorted but rather light. One of our correspondents alludes to the stocks of Hardware as not large but numerous, "that is, there are a great many stocks," with a very animated competition, which reduces profits to a minimum. It is not intimated that there will be more than an average number of new buildings erected, but with the existing agricultural conditions and hopeful feeling that prevails as to the business of the season, and if crops should turn out well, it is thought that a large business will result. Reports in regard to collections vary very much according to the locality and the idiosyncrasies of individuals, their general tenor being that they have improved since February and are fairly good, with a tendency still toward slowness. Travelers generally do not give as encouraging reports as merchants, a matter which is thus referred to by one of our correspondents whose judgment is entitled to weight: "Travelers generally report light sales. If, however, the sales of each one to the many dealers and the business of the many salesmen with the many dealers were aggregated, it would appear surprisingly different." The point is also made as promising well for the future of the State that immigrants are now more numerous than emigrants, while for some years past this has hardly been the case. This synopsis may appropriately be supplemented by the following report from a prominent jobbing house:

The condition of business generally at the present time is fair; some lines are doing better than others, though we hear of no complaints of dull trade from any source. The Hardware business is very brisk and has been for the past six weeks. The movement of heavy goods, such as Nails, Barb Wire, &c., has been lighter than at corresponding season of 1888, but sales of Shelf Hardware are larger. The stocks of Hardware in the country are not as heavy as usual at this season. Prices average lower than they have for years, and must be near bottom. The prospects for trade during the next few months are encouraging. The early spring and recent rains have created a feeling of hopefulness and confidence throughout this section. We do not look for unusual activity in building operations. Collections are quite satisfactory—better, in fact, than was anticipated at the commencement of the season. Our salesmen are keeping up their records of sales as in former years, and anticipate that the present year will be a very prosperous one.

#### Barb Wire.

The Eastern market supplied by this city is characterized by a gratifying activity, and a good deal of business is being done. To such an extent is this the case

that some of the manufacturers have difficulty in making as prompt shipments as they desire. Prices are without change, on the basis of 3.5 cents for carload lots, 3.6 cents for 3-ton lots, and 3.8 cents for smaller parcels, with deliveries as usual.

An article has appeared in some of the Western papers intimating that some of the Barb Wire manufacturers of St. Louis were intending to close down their works owing to the condition of the market and the disadvantages in freight discriminations under which they are laboring. It has also been stated that a circular has been issued by the Freeman Wire Company suggesting this. But we are authorized to deny this report so far as the Freeman Wire Company are concerned, and are advised that the company have not directly or indirectly issued a circular suggesting this cessation of operations, and that it is not their purpose to close their works, the only foundation for such a report being their intention of remodeling and readjusting their Wire mill, which, as a matter of fact, would require only a slight suspension of business, possibly for from three to five weeks.

#### Cut Nails.

Quite a considerable volume of business is being done, with quotations remaining at \$1.80 to \$1.85 for carload lots on dock. It is reported that all but three signatures have been secured to the pool plan excepting one leading mill in Central Pennsylvania, which declined to enter from the start.

#### Miscellaneous Prices.

The Standard Fiber Ware Company, Mankato, Minn., and 105 Lake street, Chicago, Ill., quote their Flax Fiber-Ware at the following prices, which relate, it will be observed, to both decorated and plain:

#### Flax Fiber-Ware.

	Plain.	Decorated.
Water Pails, 12-quart.	\$4.00	\$4.50
Dairy Pails, 14-quart.	4.50	5.00
Fire Pails, No. 1, 12-quart, No. 2, 14-quart.	4.50	5.00
Sugar Pails (with cover).	6.00	6.50
Chamber Pails, No. 1, 12-quart; No. 5, 14-quart.	6.50	7.50
Slop Pails, No. 1, 12-quart; No. 5, 14-quart.	6.50	7.50
Commode Pails, No. 1, 12-quart, No. 5, 14-quart.	6.50	7.50
Slop Jars (balance trap).	8.00	9.00
Commode Rings.	1.50	1.50
Wash-Basins, 10 1/4-inch.	2.00	2.25
Wash-Basins, 12-inch.	2.25	2.75
Wash-Basins, 13 1/4-inch.	2.75	3.25
Wash-Basins, 15-inch.	3.25	3.75
Fruit Bowls.	2.50	2.50
Servers, 12-inch.	2.00	2.00
Keelers, 11 1/4-inch.	4.00	4.00
Waste Paper Baskets, 13 inches high.	6.00	6.00
Mats, 9 inches (for table use).	1.00	1.25
Mats, 15 inches (for Cuspidors, &c.).	3.00	3.50
Mats, 17 inches (for Slop Jars, Spittoons, &c.).	3.50	4.00
Mats, 20 inches (for Slop Jars, Spittoons, &c.).	4.00	4.50
Cuspidors.	8.00	8.00
Cuspidors and 15-inch Mat, combined.	11.00	11.00
Spittoons, Daisy, 8-inch.	4.00	4.50
Spittoons, 10 and 11 inch.	6.00	6.50
Peck Measure.	4.00	4.00
Half-Peck Measure.	3.50	3.50

The following revised prices of Lead Pipe, Sheet Lead, Block Tin Pipe, &c., are announced under date April 22:

	Per pound.
Lead Pipe.	5 1/2¢
Sheet Lead.	6 1/2¢
Tin Lined Lead Pipe.	15¢
Block Tin Pipe.	45¢

It has been known for some time that the prices of Hot-Pressed Nuts have been more or less irregular, and concessions have been made beyond the prices agreed upon by the manufacturers. This has led to the giving up of the association on these goods, and the makers are now free to sell at such prices as they desire, untrammelled by combination. It is, however, to be noted that the prices ruling are about those at which the goods have been selling,

and that the present condition of things has not resulted in inducing materially lower quotations. It is to be borne in mind that Cold-Pressed Nuts, on the other hand, are in excellent condition, the agreement between the manufacturers being well maintained. A reduction of  $\frac{1}{10}$  cent per pound has been made, in sympathy with the reduced cost of the raw material, but the new prices are referred to as firmly held.

Walbridge & Co., Buffalo, N. Y., issue an interesting catalogue of their iron Reservoir Vases, which, besides giving illustrations of this well-known line, represent also Lawn Chairs, Settees and some staple Hardware. The line of Vases is exceptionally complete, including small and inexpensive ones, as well as those of more artistic pattern and more imposing dimensions. Illustrations, with a full statement of measurements, are given of the different patterns, together with list prices. One of these patterns is, it will be observed, shown in their advertisement on page 55, in which some further particulars are given in regard to the goods. The description given in the catalogue of the construction of these Vases, and the manner in which they are supplied with water, is clear and interesting. The new styles of Vases shown are especially worthy the attention of the trade. The discount sheet relating to these goods is as follows:—

	Discount.
Vases.....	30 %
Settees.....	30 %
Globe Lawn Sprinklers.....	40 %
Lawn Sprinklers Nos. 10 and 50.....	50 %
Prize Hose Reels.....	60 %
Philadelphia Mowers.....	60 %
Stable Fixtures.....	40 %

Van Wagoner & Williams Company, 82 Beekman street, New York, have issued a new catalogue showing their well-known line with recent additions. The new goods are especially in the line of Wire Coat, Hat and other Hooks. It is to be noted that the convenience of the trade is consulted in making the Real Bronze Spring Hinges subject to discount, the same as the other styles, instead of having them net, as heretofore. We shall have occasion again to refer to some of the new goods. The following is the discount sheet of the company:

	Discount.
Basin Wrenches.....	40 %
Bed Keys.....	15 %
Blind Adjusters, Domestic.....	33 $\frac{1}{2}$ %
Unique.....	33 $\frac{1}{2}$ %
Bolts, Doen's.....	70 & 10 %
Door Pulls, Gem.....	50 %
Door Springs, Gem.....	10 %
Star.....	20 %
Torrey.....	33 $\frac{1}{2}$ %
Hooks and Eyes, Malleable.....	70 & 10 %
Hooks—Ceiling, Acme.....	50 %
Champion.....	50 %
Gem.....	50 %
Miles.....	50 %
Hooks—Coat and Hat, Crown.....	50 & 5 %
Gem.....	50 %
Hero.....	50 %
Miles.....	50 %
Monarch.....	50 %
Royal.....	50 %
Union.....	50 %
Hooks—Wardrobe, Climax.....	50 %
Domestic.....	50 %
Empire.....	50 %
Jewel.....	50 %
Victor.....	50 %
Latches, Crown.....	40 %
Cupboard.....	45 %
Rail Screws.....	70 & 10 %
Sash Lifts, Gem.....	50 %
Climax.....	50 %
Spring Hinges, Acme.....	30 %
American.....	20 %
Cabinet.....	10 %
Crown.....	25 %
Empire.....	25 %
Gem.....	20 %
Hero.....	55 %
Imperial.....	20 %
Monarch.....	55 %
Oxford.....	20 %
Show-Case.....	35 %
Star.....	20 %
U. S.....	25 & 10 %

### Obituary.

William L. Humason, president of the Humason & Beckley Mfg. Company, New Britain, Conn., who are well known as Hardware manufacturers, died at his home in New Britain on the 15th inst. Mr. Humason was born in Simsbury in 1821 and went to New Britain in 1851, where he engaged in business, and in 1864 established, with others, the company with which he has since been identified. At a meeting of the directors of this company, held on the 19th inst., the following resolution was adopted:

*Whereas*, It has pleased Almighty God in His providence to remove from our midst our friend and counselor, William L. Humason, the founder and president of this company; be it

*Resolved*, That we sincerely mourn our loss; that we honor his memory; that we honor him for his many noble qualities; that we acknowledge it was through his wisdom, skill and guidance, his unswerving integrity and ability, that this company has been brought from a small beginning to its present standing among the manufacturing interests of the country.

The death of Nelson Sawyer, senior member of the firm of Sawyer Brothers, of Columbus, Wis., is announced. For upward of a year and a half Mr. Sawyer had been in failing health, but not until about ten weeks before his death was he obliged to remain at home. He was born in Wendell, Mass., in 1833. In 1853 he went to Wisconsin and entered the employ of Spencer & Buxton, then the leading blacksmithing firm and jobbers in Columbus. Upon the death, not long after, of Mr. Spencer he became a partner. On the 1st of April, 1867, he associated himself with his brother Lewis J., then the proprietor of a Hardware establishment in Columbus, and a successful business was carried on for the following 22 years. He is referred to as a man possessed of noble qualities, generous impulses, energy and excellent business qualifications.

### Hardware in the Centennial Celebration.

In the absence from the city of the president of the Hardware Board of Trade, Edward H. Cole, secretary, will represent the organization at the centennial parade May 1. The body of men already accepted for the industrial parade numbers some 110,000, and the procession will require 17 hours, it is estimated, to pass a given point, unless arrangements which are under advisement are carried out to diminish the number, or consolidate the parade in such a way as to facilitate its progress. It is thus obvious that the necessity of the case calls for a reduction rather than an increase in the number of those participating in it, and under these circumstances it is manifestly impossible that the boards of trade of the city, of which there are more than 100, should take part except through individual representatives. General Butterfield has accordingly invited the boards of trade and other organizations of like character to be represented and participate in the parade in simply a formal manner, and under this invitation Mr. Cole has, as above stated, been appointed to represent the Hardware interests. General Butterfield will name the delegated representative as an aide, and the aides so named will be assembled at a given point uptown on the morning of the parade, where they will be provided with a sash as the badge of office. When the procession arrives at that point it will be halted and the representatives or delegates will precede the column in passing the President, and after marching past the President will take seats reserved especially for them on the grand stand south of the President. A committee will prepare a brief address to be engrossed upon parchment and inclosed in a silver case. This address will be signed by all representatives of the societies

of a civil, industrial and business character and be presented to the President. The united delegates will also provide a gold medal, a silver medal, and banners to be offered as prizes or awards to the civil or industrial organizations in the parade which shall be decided by competent judges to have best complied with the rules made necessary to make the parade a success, together with making the most agreeable and effective display. The gold medal will be awarded to the first, the silver medal to the second, and the banners to the third, fourth, fifth and sixth. The decision in this award will be made by 50 or 100 men who will be stationed at different points along the line of march.

### Items.

Horton, Gilmore, McWilliams & Co., of Chicago, recently effected a sale of Hardware under rather peculiar conditions. The bill of goods is quite large, covering a very general assortment, its destination is California, and it will be shipped from New York via Cape Horn. It is believed to be the first case on record of a shipment of goods from a Chicago Hardware house to California "around the Horn."

W. H. Keeler, Buffalo, N. Y., has issued a catalogue explaining his patent Printing Wheels, which are on the market to take the place of Stencils. They are referred to as printing perfectly and rapidly with a neat and business-like effect, and are designed especially for putting the name and business of the merchant prominently before the public on boxes, wrapping paper, packages, bags, &c. A large number of sample impressions are given, showing the kind of work done by the Printing Wheel and indicating the variety of its adaptations.

Fayette R. Plumb, Philadelphia, Pa., has issued Supplement No. 1 to his catalogue of 1888. It is printed in the same elegant style as his catalogue and represents a line of Picks, Mattocks, Grub Hoes, Pick-Eyes and Striking Hammers. In his introduction he refers to the necessity of engaging in the manufacture of this line of goods in order to complete his line, and states that he succeeded a few months since in closing negotiations with the proprietors of the Washoe Tool Company, thereby becoming sole owner of their entire plant. New shops have been erected with improved equipment, thus giving him an exceptionally large capacity for the production of these goods. It is intended to make these Tools of the best material, and in addition to the regular line some of the leading goods are made from solid cast steel. It is stated that these goods will be manufactured from a soft steel for welding properties equal to the best refined iron, and that the points will be made from best tool steel and contain double the amount of stock ordinarily used for this purpose. They will be ground perfectly clean, finished in oil, and care will be taken in each department to see that they are perfect. The two leading patterns of Drilling or Striking Hammers, made from a high grade of tool steel, are also presented.

The Paddock-Hawley Iron Company, St. Louis, Mo., have issued a new catalogue and price list. It is a compactly arranged volume of 660 pages, which are well utilized in illustrating the variety of goods they are handling as manufacturers, agents, importers and merchants. After a full and satisfactory index the volume opens with Iron, Steel, Plow Shapes, Corrugated Iron, Spikes, Bolts, Nails, Horse-shoes, Anvils, Vises, Forges, Drills, Tire Benders, &c., and a large variety of tools and supplies for blacksmiths and machinists. Wagon Hardware occupies an important part of the catalogue and is represented in large variety; Lamps, Gears,

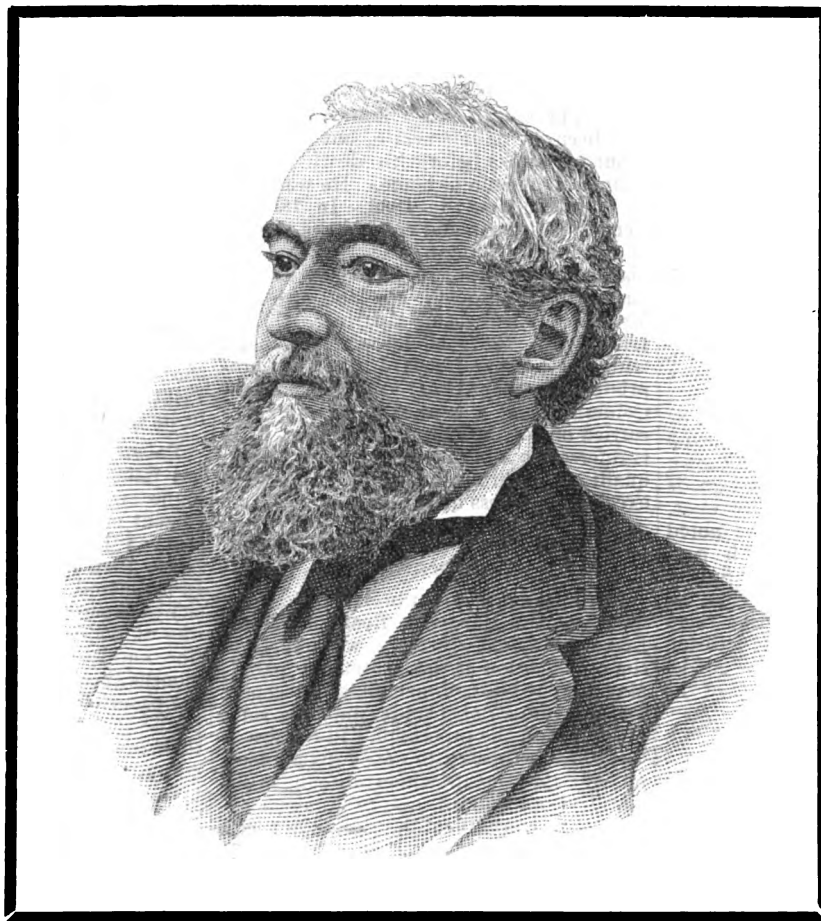
Bodies, Wagon Woodwork, &c., are appropriately shown. List prices are given throughout, the lists being the standard ones for the most part. The volume closes with interesting tables of estimated weights, and other useful information in regard to Wire Gauges, weight of metals, number of Spikes required, tempering steel, &c. It is a very creditable volume, which will be appreciated by the trade.

The Pike Mfg. Company, Pike Station, N. H., have issued a very convenient catalogue and price list for the present year, and call attention to the fact that they have added to their line since issuing their last number. The catalogue is fully illustrated, cuts being given of the different brands and qualities of Scythe, Axe and other Stones. A new and interesting feature,

### Edward B. Mead.

The death of Edward B. Mead on the 1st inst., at his home in Brooklyn, N. Y., removed one who had occupied a prominent place among Hardware merchants and who was widely known and held in high esteem. His connection with the Hardware business extended nearly as far back as that of any of the Hardwaremen of the present day, and a retrospect of his business career recalls times which are beyond the recollection of the great majority of those who are now actively connected with business life, and conditions which are very different from those now existing. At the time of his first connection with the Hardware business probably not more than 7½ per cent. of the goods sold in the United States were of

position in the store of the well-known house of William N. Seymour & Co., Chatham square, and through his influence a position was secured for him with Henry A. Beach, a broker, in whose employ he continued for some three years. In 1840 he obtained a position as clerk in the Hardware commission house of Woods & Wheelwright, 11 Platt street, his first connection with the trade in which his life was spent. On their giving up business he returned to his home in Delaware County, where, however, he remained only a short time, returning to New York in 1843, where a position had also been secured for him by his brother Andrew in the house of George Briggs & Co., commission Hardware merchants, 115 Maiden lane, with whom he continued after their removal in 1846 to No. 9 Platt



EDWARD B. MEAD.

Born 1821; died 1889.

the convenience of which will be appreciated by the trade, is the fact that under Arkansas, Washita and other Oil Stones different assortments are given. The cuts of unusual Stones, such as Knife Blade, Triangular File Piece, Needle Piece and others, as well as the more regular goods, are of interest.

The Sullivan Hardware Company, Anderson, S. C., is referred to as one of the leading concerns in Anderson, in an article published in the *Greenville Daily News* of recent date, in which the business position and enterprise of the city are extolled.

Packard & Co., Greenville, Pa., issue a special Gun catalogue, in which a variety of Breech-Loading Double Guns are shown, together with Muzzle-Loaders, Flobert and other Rifles, and attention is called to Gun Implements, Reloading Tools, Ammunition, &c.

American manufacture, the great bulk of them being imported from England and Germany, while at the present time the amount of imported goods sold is insignificant compared with those of domestic manufacture. It is also interesting to note that the houses with which Mr. Mead formed his earliest connections were identified with the interests of American manufacturers, and that the large concern of which he was for many years a partner exercised an important influence in the development of domestic production of Hardware.

Edward B. Mead was born in 1821 in Walton, Delaware Co., New York, and when in his sixteenth year he left home, coming down the Delaware River on a raft to Trenton, N. J. He remained in Trenton, however, but a short time when he was led to come to this city through the influence of his brother, Andrew J. Mead, who was already here occupying a

street. It is interesting to observe that George Briggs was one of the first manufacturers in this country of Steel Squares, and the veritable sign bearing his name was for many years carefully preserved by Charles Bliven, who at the time of young Mead's connection with the house was the partner of Mr. Briggs. These two persons who in later years were to be long and prominently associated together as manufacturers and merchants thus met for the first time. After a short time Mr. Mead obtained an interest in the business, the style of the firm still continuing George Briggs & Co., and in 1848, on the retirement of Mr. Briggs, who went into politics, the firm became Bliven & Mead, with Mr. Briggs as a special partner. Mr. Mead was married in 1850 and his widow survives him, as does also his brother, Andrew J., and three sisters. In 1857 the business was moved from 115 Maiden lane to 243 and 245 Pearl street.



and 18 and 20 Cliff street, the junior partners, Bliven & Mead, having purchased the interest of Mr. Briggs. The business of the firm was carried on in this location until 1877, during which time it was largely extended, the house becoming one of the most prominent in the country. The first year of the war was a trying one for the Hardware trade, and many old houses came to grief by reason of the depression in business, and in some cases by the loss of balances due them from customers in the South. The firm of Bliven & Mead, however, weathered the storm and were enabled to take advantage of the activity and business prosperity that soon ensued.

In 1854 Bliven & Mead were the New York agents for the Hart Mfg. Company, of which J. T. Hart, who had been manufacturing Hardware since 1838, was president, and in 1866 sold their business to the Hart Mfg. Company, Mr. Bliven becoming president. The business was conducted under this name until 1873, when the style was changed to the Hart, Bliven & Mead Mfg. Company, and in 1878 the business was removed from the old location in Pearl and Cliff streets to 107 Chambers street and 91 Reade street, thus following the course of the movement of the Hardware trade in this city. The company continued prosperous until overtaken by the hard times and depression of trade which were so trying to business houses, and its sales in some years exceeded \$1,500,000, ranking it among the largest Hardware houses in the country. When in the year 1878 the company were overtaken by financial difficulties and were forced to make an assignment Mr. Mead was unanimously chosen assignee to settle up the business, a task of some delicacy and difficulty owing to its manifold complications, which, however, was performed with painstaking fidelity and marked ability and to the general satisfaction of all concerned. When this was accomplished Mr. Mead was free to accept another engagement, and went to Chicago in the employ of Hibbard, Spencer & Bartlett, taking charge of their credits. The climate, however, did not agree with Mr. Mead or Mrs. Mead, and, notwithstanding the consideration in which he was held, Mr. Mead, from the strength of his associations in this city, was unable to feel contented in his new home, and after a comparatively short time returned to New York and became connected with the American Screw Company as their representative in this city, a position which he held until failing health compelled him to relinquish all business cares. During the greater part of his life he enjoyed robust health, but for more than a year previous to his death he was confined to his house by illness, so that when the end came it was not unexpected. At different periods in his life Mr. Mead occupied other positions of trust and responsibility, and among them may be mentioned his connection with the Branford Lock Works, for whom as early as 1865 Bliven & Mead were agents, and of whose board of directors Mr. Mead for the greater part of the time since that date was a member.

As a business man Mr. Mead is referred to by those who knew him best as having been thorough and indefatigable, with an exceptional capacity for accomplishing work, and as especially diligent and painstaking where the interests of other persons were involved. The greater part of his life was closely applied to business activities, and he rarely took a vacation except an annual visit to his home in Walton, where he indulged his favorite recreation of trout-fishing and tasted the pleasures of angling, to which he was an enthusiastic devotee. During his protracted sickness, which lasted nearly a year, the thought of this recreation of his boyhood and mature life was refreshing to

him, and he fancied that if he could again visit the streams which he knew so well it would be the means of restoring him to health. The cordial and genial bearing of Mr. Mead are well known by all who have been brought in contact with him, and notwithstanding the cares and perplexities of his life his geniality and cheerfulness never failed him, and there was about him even in his advanced years much of the vivacity, kindliness and buoyancy of youth. These and other personal qualities and the unquestioned integrity of his character gave him many friends in the trade, by whom he was held in high esteem and who received the tidings of his death with a sincere personal sorrow.

#### Items.

Yawman & Erbe, Rochester, N. Y., have issued a circular relating to their Elevator Floor Stop and Lock, of which illustrations are given showing its special features and advantages, with a detailed description of the Lock.

The trade will be interested to learn that at the Melbourne exhibition, in the department devoted to Cutlery, Hardware and Iron-mongery, John Chatillon & Sons, 89 Cliff street, New York, were awarded the first order of merit on Spring Balances. We are also advised that the goods that thus received the highest commendation were the regular goods of the manufacturers as exhibited by their agent and were not specially prepared for the exhibition.

Stafford & Rix, Keokuk, Iowa, the well-known wholesale Hardware and Iron House, have sold their entire stock of Shelf and Heavy Hardware, Iron and Wagon Stock to A. Weber & Co., of that city, to whom they refer as their neighbors in the Hardware business and commend them as courteous, efficient business men, every way reliable. They further call attention to the fact that the trade will thus be offered a stock of goods second to none in the Mississippi Valley. They also in taking this leave of the Hardware trade of Iowa, Missouri and Illinois extend thanks to their customers for the long-continued patronage bestowed upon them, and invite a continuance of it to their successors. We understand that in thus disposing of their Hardware business they intend to engage in the banking business in Chattanooga, Tenn., and in this new departure will have the best wishes of their many friends in the trade, who will regret their withdrawal from the Hardware field.

Tucker & Cox, 230 Market street, Philadelphia, Pa., issue a four-page price list of Steel Stamps and Dies, in which specimens of their letters are given, with prices of their Steel Letters and Figures in sets. Their Burning Brands for the use of builders and others are also represented.

H. L. Waterman, Mills Building, New York, has been appointed agent for the Hartman Steel Company, Carnegie, Phipps & Co., Beaver Falls, Pa., for Wire Nails, Copper Wire, &c.

In our issue of February 14 a description was given of the B. M. T. Saw, devised by Warren Bundy, Minnesota City, Minn., and manufactured by the Montague-Woodrough Saw Company, Chicago, Ill., with special reference to the form of the teeth. We are advised, however, that the principle on which the teeth are constructed and arranged is not entirely new, as per the following letter from prominent Saw manufacturers:

Upon referring to some of our old papers we find that Saws made with similar teeth were made by us 30 to 35 years ago, and ever since then on the same principle. We are led to write from the fact of this being presented as something new, whereas such is not the case, for in making further search we find patents of recent date, 1877 and 1881, in which teeth were made as represented in your paper. If you

could take the time to look over the Saw catalogues you would find the principle of arranging two beveled teeth and one oiseaued tooth in groups to be nothing new, having been used by different Saw-makers in this country for several years. We do not wish to be considered in the light of finding fault with our competitors for introducing what they suppose to be new devices for Hand-Saw teeth, but, being Hand-Saw manufacturers, our objection is to its being brought forward as a recent improvement.

The White Mountain Freezer Company, Nashua, N. H., issue a striking and attractive show-card designed to call attention to their line of Freezers. It is entitled "Jack Frost and His Bride," and the Triple-Motion White Mountain Ice-Cream Freezer is prominently introduced. They have also prepared a pretty lithographed card, which is furnished to the trade in any quantity desired, with their imprint on the back. Their catalogue is neatly printed, and illustrates the large variety of Freezers they make. Their New York office is 99 Chambers street, W. H. Quinn & Co. being their agents.

The Ross & Fuller Association, 83 Chambers street, New York, have been appointed exclusive agents for the sale of the Perfection Inside-Edge Stove-Pipe Elbow, manufactured by the Detroit Elbow Company, Detroit, Mich., on which they are now prepared to quote prices.

A paragraph has been going the round of the papers to the effect that a new enterprise with a capital of something like \$1,000,000 is being established at Cleveland, Ohio, for the manufacture of Screws. Inquiry develops the fact that the rumor is, however, entirely without foundation.

On page 81 our readers will observe the advertisement of C. H. Taisey, Denver, Col., in which Blood's Patent Adjustable Hose-Holder is illustrated. The points made in regard to this Holder are its durability and portability, and the fact that it will accommodate any size of Hose and in any desired position for watering purposes. The Holders are 30 inches high and are made of iron japanned, galvanized or nickel-plated, and also of polished brass. It will be understood that the legs screw into the Holder, thus permitting it to be taken apart readily, and at the end of the season laid away in small space.

Johnson & Colton, Montpelier, Vt., in their price list No. 6 describe the line of Saddlery Hardware of which they are manufacturers. They call special attention to the Colton Patent Buckle, which is made to prevent the mane or tail of a horse from catching on the point of the tongue, as it often does where a common Buckle is used. The metallic Check-Rein Loop is also specially referred to as cheaper and more durable than any made from leather.

Biddle Hardware Company, Philadelphia, Pa., have issued a circular of seasonable goods, representing Lawn Mowers, Hoes, Steel Goods, Scythes, Cultivators, Saddlery Hardware, Spring Hinges, Freezers, &c. It calls attention also to the manufacturers for whom they are agents or representatives.

John Moore, 53, 57 and 59 Warren street, New York, issues a neat pamphlet, with price list of leading styles of harness, calling attention also to horse blankets, horse clothing, &c.

C. W. Packer, 20 N. Fourth street, Philadelphia, has issued a neat and convenient price list of his Standard, Expert and Model Ice-Cream Freezers. His Confectioner's Machine Freezer is also illustrated. A brief description is given of the special features of this machine and the points made in regard to them, with some standard recipes and directions for freezing.

### Handle for Milk-Can Covers.

Berger Bros., of No. 237 Arch street, Philadelphia, Pa., have placed upon the market a convenient handle for milk-can covers, a general view of which is presented herewith. The device consists of two galvanized castings, riveted together in such a way that the top or cap of the handle will revolve, while the lower portion, which is fastened to the can cover, is stationary. This permits the milk can to be rolled along upon the rim of the bottom while the operator firmly grasps the top of the patent cover handle. This is a matter of great convenience and is claimed



Seal's Handle for Milk-Can Covers.

to facilitate the loading and unloading of milk cans. The device is made under Seal's patent, and is said to be the only revolving handle made.

### The New Barb Wire.

The accompanying illustration represents a two-point barb wire called the Texas barb, which is put on the market by the Iowa Barb Wire Company, 98 Reade street, New York. The special feature of this wire is that the barb is flattened one-half, with the result of saving one-third the weight of the barb, or about 10 per cent. of the total weight of the barb wire. The company advise us that tests made show that their wire has a special strength, and it is obvious that the strength is not affected by the size of wire used for the barbs, so that there is a clear saving in



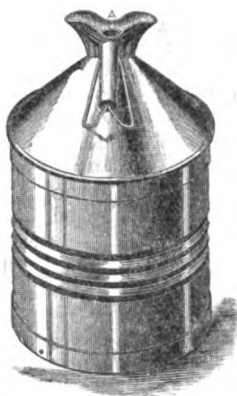
Texas Barb Wire.

weight resulting from the use of Texas barb. The price for this wire will be 10 cents per 100 pounds extra, which they refer to as representing about one-third of the gain to the consumer in weight as compared with other barbs.

### Safety Can for Gasoline.

In the accompanying engravings we show an automatic safety can which is being supplied to the trade by George M. Clark & Co., of Chicago, Ill., and is known under the name of Jewel. This can is provided with a malleable-iron head or nozzle which cannot be dented or pressed out of shape, rendering it very durable. It is constructed with a double pitcher-shaped outlet, which permits of its use by either right or left handed persons. Referring to Fig. 1 of the engravings, A is a valve or stopper which is held firmly to its seat by a strong spring, a general view of which is shown in Fig. 2. The construction of this valve is such as to practically make a close ball-joint, being easily opened for use and which instantly closes when released from the hand. The stopper being below the upper part of the nozzle, is

fully protected from disturbance should the can by accident fall to the floor or come in contact with any object. A guard



Safety Can for Gasoline.—Fig. 1.—General View of Can.

placed within the can prevents the stopper being drawn up too far and straining the spring. This spring is made of steel



Fig. 2.—View of Valve and Spring.

wire, spiral in form and satisfactory in operation. The valve is made of hard brass, and is automatic and self-adjusting in its action. This can is protected with a wooden bottom provided with slots cut

### New Freezers.

The Gooch Freezer Company, Cincinnati, Ohio, are placing on the market this season the Zero, the Pet and the Boss Ice-Cream Freezers, which are referred to as



Fig. 1.

well finished and made of the same material as their well-known Peerless, which has been on the market for the past 18 years. The Zero, Fig. 1, is a full-sized freezer, and the dasher has a self-adjusting scraper to remove the cream from the side



Fig. 2.

of the can, and the freezer will operate with or without the dasher, as desired. It is an easy adjustment and well made. The Pet is represented in Fig. 2, and is, it will be seen, slightly different in construction. It has also a self-adjusting scraper. The Boss, Fig. 3, is described as a solid, well-



Fig. 3.

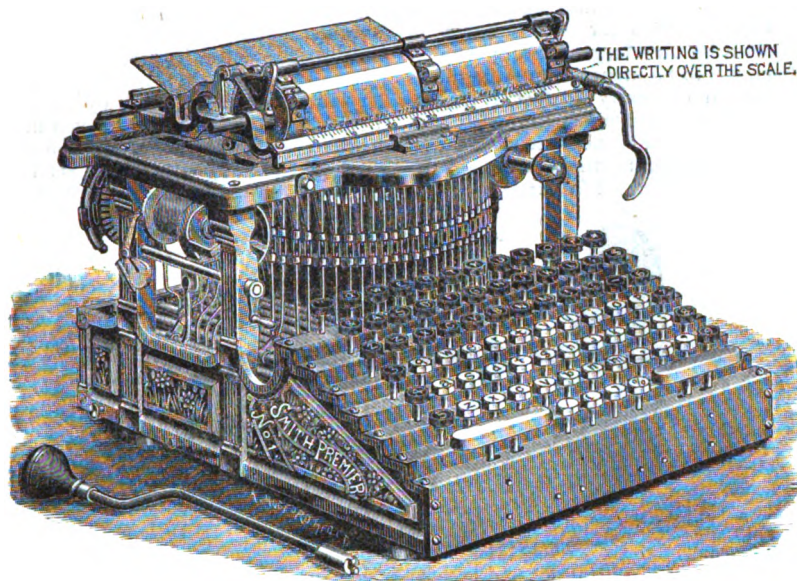
made freezer to meet the demand for a very cheap article and is full size, with self-adjusting scraper to cut the cream from the side of the can. All the above freezers are made in 2, 3, 4 and 6 quart sizes.

### The Smith Premier Type-Writer.

One of the latest candidates for public favor in the shape of a type-writing machine is that manufactured and offered to the trade by the Smith Premier Type-Writer Company, of Syracuse, N. Y. This

operated. This is somewhat different from that employed upon the Remington or Caligraph, and consists essentially of a rocking instead of a lever motion. In the engraving 1 is the key with stem, 2 is the rocking shaft, 3 is the connecting rod or wire, and 4 is the type bar. The manu-

carriage is gibbed solidly to the machine, and cannot be raised, as is the case with other type-writers at present on the market. The platen, with its paper-feeding mechanism, which is shown detached in Fig. 5, is mounted upon an auxiliary frame, or cradle, which in turn is carried on the carriage frame, and may be instantly detached from the machine by drawing up the lever shown at the left in Fig. 1 of the illustrations. This enables the operator to remove the platen, with its paper, and to instantly substitute another. The advantage of this arrangement will be readily appreciated by those who desire to change from ordinary work to that of manifolding, and do not wish to remove the paper from the platen. Another feature to which attention is directed is the locking mechanism, by means of which, when the alarm bell rings at five letters from the end of the line, the same as in other type-writers, this machine will print five letters or characters and lock the entire system of keys, so that no additional impressions can be made. This prevents blurring the last word by striking several letters one upon the other, as frequently happens in the use of machines at present well known to the public. The lever for drawing the carriage back from each line of printing projects forward and downward, as indicated at the right in Fig. 1. This lever is attached to a rock-shaft, which extends backward and is neatly incased in the carriage frame. At the opposite end



The Smith Premier Type-Writer.—Fig. 1.—General View of Machine with Platen Drawn Forward to Show the Writing.

machine represents the results of a great deal of study and experimentation, and, we are informed, is built to meet all the requirements of a first-class machine. The manufacturers state that it is thoroughly made of the best materials and finished in the highest style of the art. In the accompanying engravings we present a number

facturers point out that the use of this device enables the upper-case, or capital-letter, keys to be arranged in a manner to exactly duplicate the lower-case, or small-letter, keys, and also to use steel in the place of wood. Every key of the machine is said to have the same leverage as every other key, which is claimed to be the only ar-

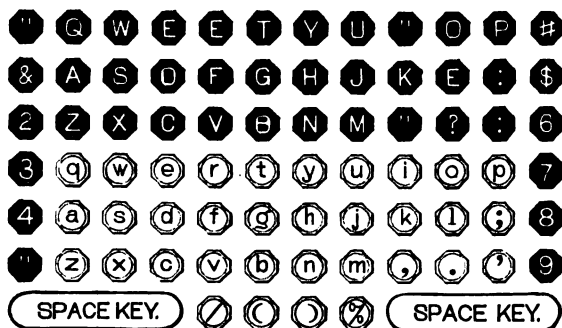


Fig. 2.—The Keyboard.

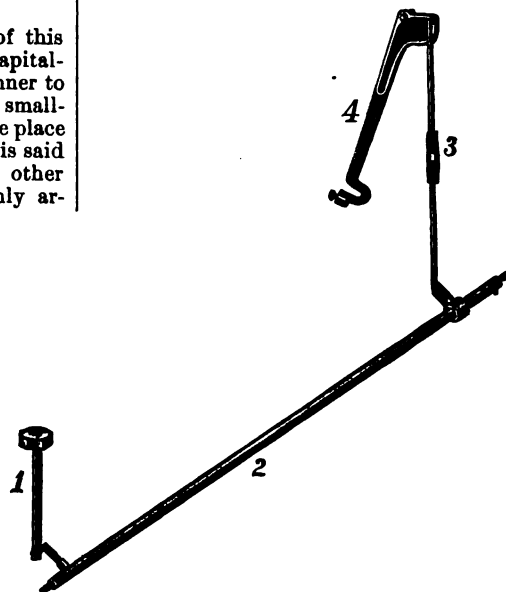


Fig. 3.—Type-Operating Mechanism.

of views which, in connection with the following description, will enable the reader to form a very comprehensive idea of the principal features of construction.

In Fig. 1 is shown a general view of the machine, with the platen drawn forward for the purpose of inspecting what has been written. Fig. 2 represents the keyboard employed on this machine. It will be noticed that there are 78 character keys, arranged in straight rows in all directions, and that the shape of the key-board is a rectangle. The lower-case keys are white, while the upper-case letter, numeral and character keys are black. The upper and lower case letters are arranged in the same order, thus facilitating the work and relieving the mind of search for the required character. It will also be noticed that this key-board possesses two space-keys instead of one. The tips of the keys are celluloid and are screwed upon a steel disk, which is riveted to a steel stem. The characters are inlaid in the keys, and are claimed to be thoroughly durable. In Fig. 3 of the engravings is presented the mechanism by which the type is

arrangement yet known whereby it would be possible to make a double-case type-bar machine with a full complement of keys in so compact a form. As the machine is operated the type bars are brought up between fingers arranged below the

of the rock-shaft is a pawl, which engages with an annular ratchet-wheel. When the lever is pulled downward for the purpose of drawing the carriage back to commence a new line, the shaft is rocked and the pawl at its end turns the platen automa-

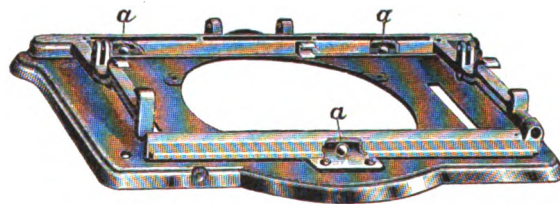


Fig. 4.—The Carriage.

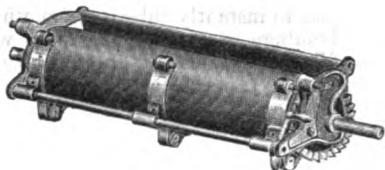
top plate, which center the type and maintain alignment. The carriage shown in Fig. 4 of the engravings is provided on its under side with grooves corresponding to similar grooves in the top plate of the machine. In these grooves are hardened steel balls, upon which the carriage runs, reducing the friction to a minimum. The

ically a single or double line space, as may be desired.

The manner of feeding the ribbon is another important feature to which the manufacturers of this machine direct particular attention. It consists of a compound motion that feeds the ribbon, which is 1½ inches wide, squarely across its width a



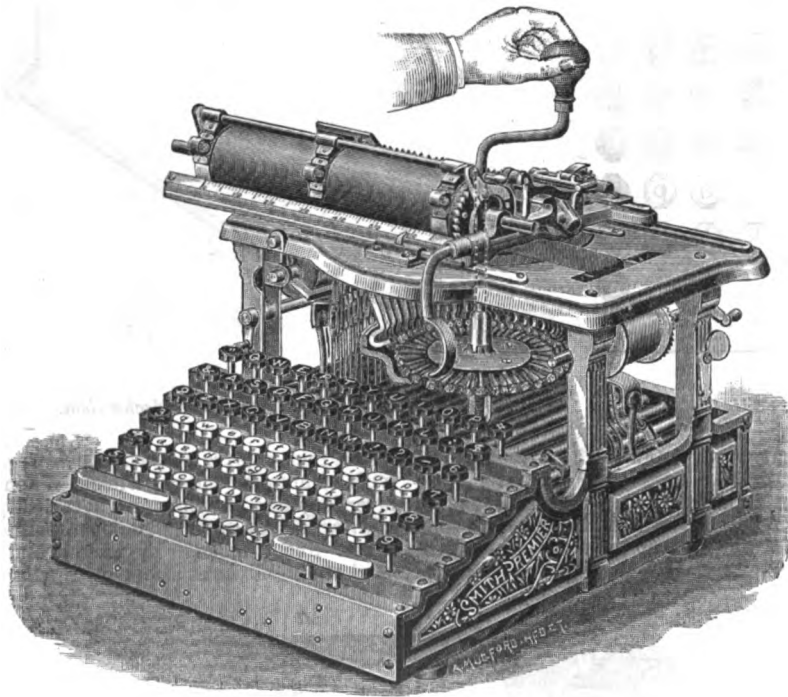
each line of printing. When the carriage is drawn back for the purpose of commencing a new line the ribbon is drawn lengthwise about the width of one type. This serves to bring the entire surface of the ribbon into use. It is stated that the time required to transfer or feed the ribbon from one spool to the other in this machine ranges from two to four days of con-



*The Smith Premier Type-Writer.—Fig. 5.—The Platen Detached.*

tinuous writing. It is also claimed by thus using the entire surface of the ribbon the color of the written sheet is kept uniform, and the curling of the ribbon, so annoying at times, is entirely avoided. This machine employs but a single scale. In case an error should occur, it appears directly over the scale. The carriage may then be moved until the point for correction is opposite the index, or pointer, when, by returning the platen to the writing position and striking the proper key, the error is quickly and surely corrected.

In Fig. 6 is shown the process of cleaning the type. This, it will be noticed, is a somewhat radical departure, and is a labor-saving device which cannot fail to be appreciated by all who are called upon to use type-writers. In operating this device the work may be left in the machine, and by drawing the platen forward and introducing the crank, as indicated in Fig. 6,

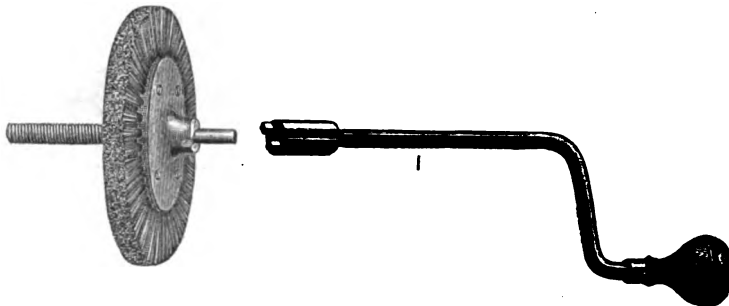


*Fig. 6.—Showing Method of Cleaning the Type.*

the type may be brushed by giving the crank a few turns in both directions. This rapidly accomplishes the desired result and possesses many advantages over the old process. The type bars of the machine in their normal position form a circle with the type facing inward. Just below is located the cleaning brush, fitted with a threaded shaft, and upon being turned with the detachable crank, shown at the left of machine in Fig. 1, rises up in contact with the type. When the brush is in its normal position it is entirely out of the way of the type bars in writing. Fig. 7

of the engravings shows the brush-wheel removed from the machine and also the crank for operating it.

At the Mannesmann Pipe Works, at Remscheid-Blieidinghausen, Germany, the Mannesmann process of making pipes from solid bars has thus far been applied in manufacturing on a large scale pipes ranging from 0.8 to 8½ inches in outside diameter and up to nearly 20 feet in length. Pipes of smaller diameter have also been turned out, but have not been placed on the market owing to the demand for the larger sizes. Pipes of a larger outside

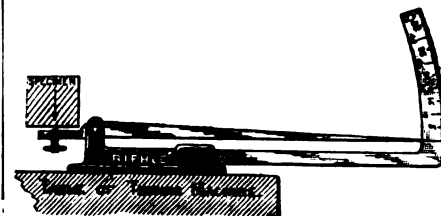


*Fig. 7.—Type-Cleaning Brush and Crank.*

diameter than 8½ inches have not yet been made simply because of lack of power at the works. In general, it has been found that with increasing sizes the commercial advantages of the process become more apparent, there being no special mechanical difficulties in manufacturing the larger pipes, while the high speed of rolling, which remains the same for all sizes, makes a larger output possible when handling the large diameters without increasing the working cost. As to the speed

#### Adjustable Transverse Indicator.

The adjustable transverse indicator here illustrated consists of a cast-iron base, to which is attached an indicator arm of polished brass graduated in  $\frac{1}{16}$  inch. At the other end of the stand is a mounted needle beam, proportioned to multiply the deflections ten times, so that  $\frac{1}{16}$  on graduated arm represents  $\frac{1}{160}$  of deflection of specimen, and by judging of the intervals between marks even finer deflections can be noted. The beam is fitted with narrow adjustment for setting the needle at zero and starting the tests. This



*Adjustable Transverse Indicator.*

apparatus is simple and portable, and can be used on the table of any testing machine by seeing that it is properly leveled to suit height of transverse tools used. The importance of this device to those investigating the elasticity of specimens under transverse strain is apparent. An apparatus of this kind can be made in several sizes, suited for the largest as well as

the smallest testing machine. The one we have shown in this illustration was made for the Dennis Long Company, Louisville, Ky., by Riehlé Bros., proprietors of the Philadelphia Scale and Testing Machine Works, Ninth and Master streets, Philadelphia.

**Chain-Making in England.**—In par's of England chain-making is prosecuted to an increasing extent by women and children. During a sitting in London of the House of Lords' Committee representatives of several trades associations testified that frequently one family worked in one workshop and were paid according to the work done, or sometimes at so much per week. These workshops were visited occasionally by the factory inspector, but they were so numerous that they could not be investigated frequently. The iron was given out by weight. Workmen got the material from the masters direct, except in the case of hired workshops. The price received by the middleman who owned and let the shop was often 20 per cent. more than was paid by him to the worker. Generally speaking, the bellows were blown by women, and very hard work it was. Men, women and children, and girls under 18 years of age, worked from 12 to 14 hours a day for four days a week, but not so long on Saturdays and Mondays. Factory inspectors had intervened on a few occasions only. Women and children would earn from 4/ to 6/ per week, and men from 10/ to 12/ or 14/ on common chain.



# CURRENT HARDWARE PRICES.

APRIL 24, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmed Edge, 1-10's.....	25¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
Double Waterproof, 1-10's.....	1.40
Musket Waterproof, 1-10's.....	50¢
G. D.....	25¢
S. B.....	30¢

Union Metallic Cartridge Co.	
F. C. Trimmed.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	25¢
Dbt. Waterproof.....	1.40
Dbt. Waterproof, in 1-10's.....	1.40
S. B. Genuine Imp.orted.....	45¢
Eley's R. B.....	54¢
Eley's D Waterproof, Central Fire.....	1.80

Cartridges.	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., 1.75.....	2¢
Blank Cartridges, 32 cal., 3.50.....	2¢
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball, 1.75.....	2¢
B. B. Caps, Con. Ball, Swgd., 2.00.....	2¢

Primers—	
Berdan Primers, 1.00.....	2¢
B. L. Caps (for Sturtevant Shells) 1.00.....	2¢
All other Primers, 1.30.....	2¢

Shells—	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge.....	25¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	55¢
I. X. L., 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	3.25

Shells Loaded—	
A. M. Co. List No. 19, 1887.....	20¢

Wads—	
U. M. C. & W. R. A.—B. E., 11 up, 2.00.....	2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.80
U. M. C. & W. R. A.—B. E., 7&8.....	2.00
U. M. C. & W. R. A.—P. E., 11 up, 3.10.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.80
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.80

Anvils.—	
Eagle Anvil, 10¢.....	20¢
Peter Wright's.....	94¢
Armstrong's Mouse Hole.....	34¢
Armstrong's Mouse Hole, Extra, 11¢.....	11¢
Trenton.....	94¢
Wilkinson's.....	94¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	35¢

Anvil Vise and Drill—	
Millers Falls Co., 18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, 38.00.....	40¢

Apple Parers—	
Advance.....	5¢
Antim Combination.....	5.50
Baldwin.....	5.25
Champion.....	7.25
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	3.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	6.00
Monarch.....	15.00
New Lightning.....	4.00
Orion.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.50
72.....	4.25
75.....	4.50
78.....	5.75

Augers and Bits—	
Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher, Cook's, Douglas Mfg. Co.).....	55¢
Cook's, N. H. Copper Co. 50¢10¢50¢10¢50¢	
Ives' Circular Lp.....	60¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension.....	40¢
Patent Solid Head.....	40¢
C. E. Jennings & Co., Auger Bits.....	40¢
3 1/2 quarters, No. 5, 8; No. 30, 35.50, 20¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	20¢
Car Bits.....	50¢
L. Hommedieu Car Bit.....	15¢
Forstner Pat. Aug Bits.....	10¢

## Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas.....	25¢
Bonney's Adjustable, 7/8 doz.....	40¢
Stearns.....	20¢
Ives' Expansive, each \$4.50.....	60¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

## Expansive Bits—

Clark's small, 1/8; large, 3/8.....	35¢
Ives' No. 4, 7/8 doz.....	40¢
Swan's.....	40¢
Stearns, No. 1, 23¢; No. 2, 32¢.....	35¢
Stearns, No. 2, 48¢.....	20¢

## Gimlet Bits—

Common.....	7¢
Diamond.....	10¢
Bee.....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 7/8 doz.....	35¢
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

## Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢
Williams' or Holt's, for wood.....	40¢

## Ship Augers and Bits—

L. Hommedieu's.....	15¢
Watrous.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

## Awl Hafts—

Sewing, Brass Fer. 7/8 gr.....	35¢
Pat. Sewing, Short, 1.00 7/8 gr.....	40¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top, 7/8 gr.....	10¢
Pat. Peg, Leather Top, 7/8 gr.....	12¢

## Awls, Brad Sets, &c—

Awls, Sewing Common 7/8 gr.....	1.70
Awls, Should. Peg, 7/8 gr.....	2.45
Awls, Pat. Peg.....	40¢
Awls, Shouldered Brad, 2 7/8 gr.....	35¢
Awls, Handled Brad.....	75¢
Awls, Handled Scratch 7/8 gr.....	75¢
Awls, Socket Scratch.....	1.50

## Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	55¢
Fray's Adj. Tool Hds., Nos. 1, 2, 3, 4, 5.....	1.12
Miller's Falls Adj. Tool Hds.....	25¢
Nos. 1, 2, 3, 4, 5.....	25¢
Henry's Combination Hart.....	40¢
Brad Sets.....	40¢
No. 42, 10.50; No. 43, 12.50.....	70¢
Stanley's Excelsior.....	30¢
No. 1, 7.50; No. 2, 4.00; No. 3, 8.50.....	30¢

## Axes—

### Makers' and Special Brands—

First quality.....	7¢
Others.....	5¢

## Axle Grease—

Fraser's.....	1¢
Fraser's in boxes.....	9¢
Dixon's Everlasting, in bxs.....	1¢
Dixon's Everlasting.....	1¢
Lower grades, special brands.....	5¢

## Axles—

No. 1.....	4¢
Nos. 7 to 14.....	5¢
Nos. 15 to 18.....	47¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	33¢
Less than 10 sets.....	33¢
Over 10 sets.....	33¢

## Bag Holders—

Sprengle's Pat.....	18¢
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## Balances—

Spring Balances.....	50¢
Common 24 lb.....	1.50
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells—

### Hand—

Light Brass.....	70¢
Extra Heavy.....	60¢
White Metal.....	60¢
Silver Chime.....	33¢
Globe (Cone's Patent).....	25¢

### Door—

Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	25¢
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co's.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

## Case—

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	20¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Farm Bells.....	3¢
Steel Alloy Church and School Bells.....	40¢

## Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

## Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

## Bench Stops—

Morrill's.....	50¢
Hotchkiss's.....	50¢
Weston's, No. 1, 10; No. 2, 20.....	25¢
McGill's.....	10¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension.....	40¢
Barber's.....	40¢
Ives.....	60¢
Diagonal.....	25¢
Angular.....	25¢

## Blind Adjusters—

Domestic.....	30¢
Excelsior.....	10¢
Washburn's Self-Locking.....	20¢

## Blind Fasteners—

Mackrell's.....	20¢
Van Sand's Screw Pat., 15¢ gr.....	60¢
Van Sand's Old Pat., 15¢ gr.....	55¢
Washburn's Old Pattern, 7/8 gr.....	80¢
Merriman's.....	new list
Austin & Eddy No. 2008, 7/8 gr.....	30¢
Security Gravity, 7/8 gr.....	30¢

## Blind Staples—

Barbed, 1/4 in. and larger.....	7¢
Barbed, 3/8 in.....	8¢

## Blocks—

Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

## Bolts—

### Door and Shutter—

Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

### Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct., '84.....	75¢
Phila. pattern, list Oct. 7, '84.....	75¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

## Tire—

Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company.....	70¢
Empire, list Feb. 28, '83.....	70¢
Phila., list Oct. '84.....	82¢
Keystone, Philadel., list Oct. '84.....	80¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company.....	70¢
Norway, Phila., list Oct. 16, '84.....	75¢
Eagle, Phila., list Oct. 16, '84.....	80¢
Phila., list Oct. 16, '84.....	82¢
Bay State, list Feb. 28, '83.....	70¢
R.B. & W., Philadel., list Oct. 16, '84.....	82¢

## Stove and Flow—

Stove.....	65¢
Flow.....	60¢
R. B. & W., Flow.....	55¢

## Borax—

### Boring Machines—

Without Augers. Upright. Angular.....	5.50
Douglas.....	6.75
Snell's, Rice's Pat. 5.50.....	6.75
Jennings.....	6.75
Other Machines.....	2.55
Phillips' Patent with Augers.....	7.00

## Bow Pins—

Humason, Beckley & Co.'s.....	60¢
Sargent & Co.'s.....	17¢
Peck, Stow & W. Co.....	50¢

## Braces—

Barber's.....	50¢
Nos. 10 to 16.....	50¢
Nos. 30 to 33.....	50¢
Nos. 40 to 63.....	50¢
Barker's.....	75¢
Plated, Nos. 8, 10 and 12.....	65¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barber's.....	60¢
Spofford.....	60¢
Common Ball American.....	1.10
Bartholomew's.....	50¢
Nos. 25, 27 and 30.....	50¢
Nos. 117, 118, 119.....	70¢

## Amidon's

Barker's Imp'd Plain.....	75¢
Barker's Imp. Nickle.....	65¢
Ratchet.....	75¢
Eclipse Ratchet.....	60¢
Globe Jawed.....	40¢
Corner Brace.....	40¢
Universal, 8 in., 32.10; 10 in.....	32.25
Buffalo Ball.....	1.10
P. S. & W.....	

<b>Cards—</b>		<b>Cockeyes—</b> 50%		<b>Drill Chucks—See Chucks.</b>		<b>Freezers, Ice Cream—</b>	
Horse & Curry.....10&10&10&10%		<b>Cocks, Brass.</b>		<b>Dripping Pans—</b>		Buffalo Champion.....60&10&5%	
Cotton.....10&10&10%		Hardware list.....40.&10&2%		Small sizes.....\$ 2 64¢		Shepard's Lightning......65 @ 65&5%	
Wool.....10&10&10%		<b>Coffee Mills—</b>		Large sizes.....\$ 2 64¢		White Mountain.....50&20&5%	
<b>Carpet Stretchers—</b>		Box and Side, List Jan. 1, 1888.....50&2%		<b>Egg Beaters.</b>		New Arctic.....50&20&5%	
Cast Steel, Polished.....\$ doz \$2.25		American, Enterprise Mfg Co.20&10&30%		Dover.....\$ doz \$1.50		Gem......65%	
Cast Iron, Steel Points.....\$ doz 80¢		The Swift, Lane Bros.....20&10%		National.....\$ doz \$4.50		Blizzard......70%	
Socket.....\$ doz \$1.75		<b>Compasses Dividers, &amp;c—</b>		Family (T. & S. Mfg. Co.), \$ gro \$17.00		Double Action Crown......80%	
Bullard's.....25&25&10%		Compasses, Calipers, Dividers.70&70&10%		Triumph (T. & S. Mfg. Co.), \$ gro \$10.50		Star......60%	
<b>Carpet Sweepers—</b>		Bemis & Call Co.'s		Advance, No. 1.....\$ gro \$10.50		Peerless and Giant.....60&10	
Bissell No. 5.....\$ doz \$17.00		Dividers.....60&5%		Advance, No. 2.....\$ gro \$10.00		Zero and Pet......65&10	
Bissell No. 7 New Drop Pan.....\$ doz \$19.00		Compasses & Calipers.....50&5%		Bryant's.....\$ gro \$15.00		Boss.....55&10&10	
Bissell, Grand.....\$ doz \$35.00		Wing and Inside or Outside.....50&5%		Double (H. & R. Mfg. Co.).....\$ gro \$12.20		<b>Fruit and Jelly Presses—</b>	
Grand Rapids.....\$ doz \$34.00		Double.....80%		Easy (H. & R. Mfg. Co.).....\$ gro \$14.00		Enterprise Mfg. Co.....20&10&30%	
Crown Jewel, No. 1, \$18.00; No. 2, \$20.00		Excelsior.....30%		Spiral (H. & R. Mfg. Co.).....\$ gro \$16.20		Hemle.....\$ doz \$3.75&\$4.00	
Maglo.....\$19.00; No. 3, \$20.00		J. Stevens & Co.'s.....25&10%		Spiral (H. & R. Mfg. Co.).....\$ gro \$4.50		Shepard's Queen City.....\$ doz \$3.75&\$4.00	
Jewel.....\$ doz \$17.00		Starrett's		Paine, Diehl & Co.'s.....\$ gro \$24.00		<b>Fry Pans—</b>	
Improved Parlor Queen, Nickeled.....\$ doz \$27.00		Spring Calipers and Dividers 25&10&10%		<b>Egg Poachers—</b>		High List.....75&5&75&10	
Japanned.....\$ doz \$24.00		Lock Calipers and Dividers.....25&10%		Buffalo Steam Egg Poachers, \$ doz, No. 1, \$6.00; No. 2, \$9.00.....25%		No.....0 1 2 3 4	
Excelcior.....\$ doz \$22.00		Combination Dividers.....25&10%		Electric Bell Sets—		\$ doz \$3.75 \$4.70 \$5.30 \$5.95 \$6.55	
Garland.....\$ doz \$13.00		<b>Coopers' Tools—</b>		Wollensak's.....20%		No.....5 6 7 8	
Parlor Queen.....\$ doz \$16.00		Bradley's.....20%		Bigelow & Dowse.....20%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Housewife's Delight.....\$ doz \$15.00		Barton's.....20%		Emery—No. 4 to No. 54 to Flour, CF		No.....0 1 2 3 4	
Queen.....\$ doz \$16.00		L. & J. White.....20%		150 gr. F F F.....24¢		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Queen, with band.....\$ doz \$18.00		Albertson Mfg. Co.....25%		Kegs, \$ b.....45¢		No.....5 6 7 8	
King.....\$ doz \$30.00		Beatty's.....30%		1/2 kegs, \$ b.....54¢		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Weed, Improved.....\$ doz \$18.00		Sandusky Tool Co.....30&30&5%		1/4 kegs, \$ b.....54¢		No.....0 1 2 3 4	
Hub.....\$ doz \$18.00		<b>Corkscrews—</b>		10-b cans, 10.....6 ¢		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Cog Wheel.....\$ doz \$18.00		Humason & Beckley Mfg. Co.40&40&10%		In case.....6 ¢		No.....5 6 7 8	
Conqueror.....\$ doz \$22.00		Clough's Pat.....35¢&35¢&5%		10-b cans, 10.....6 ¢		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Easy.....\$ doz \$22.00		Howe Bros & Hulbert.....35%		10-b cans, 10.....6 ¢		No.....0 1 2 3 4	
Monarch.....\$ doz \$22.00		<b>Corn Knives and Cutters—</b>		than 10.....10 ¢		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Goheen.....\$ doz \$21.00		Bradley's.....10%		Enameled and Tinned Ware—		No.....5 6 7 8	
Advance.....\$ doz \$18.00		Wadsworth's.....25%		See Hollow-Ware.		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Ladies' Friend, No. 1, \$ doz \$15.00		<b>Cradles—</b>		<b>Escutcheon Pins—</b>		No.....0 1 2 3 4	
No. 2.....\$ doz \$18.00		Grain.....50&2%		Iron, list Nov. 11, 1888.....50&10&50&10&5%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
American.....\$ doz \$15.00		<b>Crayons.</b>		Brass.....60&60&5%		No.....5 6 7 8	
Grand Republic.....\$ doz \$35.00		White Crayons, \$ gr 12¢&12¢&4%		<b>Escutcheons.</b>		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
<b>Cartridges—</b>		M. S. Mfg. Co. Metal Workers, \$ gr \$2.50		Door Lock.....Same dis as Door Locks.		No.....0 1 2 3 4	
<b>See Ammunition.</b>		M. S. Mfg. Co., Rolling Mill, \$ gr \$2.50		Brass Thread.....60&60&10%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
<b>Casters—</b>		See also Chalk.		Wood.....25%		No.....5 6 7 8	
Bed.....Brass.....55&55&5%		<b>Crow Bars—</b>		<b>Faucets—</b>		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Plate.....Others.....60&60&5%		Cast Steel.....\$ b 4¢		Fenn's.....40%		No.....0 1 2 3 4	
Shallow Socket.....40&10%		Iron, Steel Points.....\$ b 3¢&3¢&4%		Bohren's Pat. Rubber Ball.....25%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Deep Socket.....40&10%		<b>Curry Combs—</b>		Fenn's Cork Stops.....35¢&35¢&5%		No.....5 6 7 8	
Yale Casters, list May, 1884.....30&10&40%		Fitch's.....50&10&50&10&10%		Star.....60%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Yale, Gem.....60&60&5%		Rubberper doz \$10.00.....20%		Frury's Pat. Petroleum.....40&5&2%		No.....0 1 2 3 4	
Martin's Patent (Phoenix).....45&10&50%		Perfect.....50%		B. & L. B. Co.		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Payson's Anti-friction.....60&60&5%		<b>Curtain Pins—</b>		Best Lock, Open and Shut Key.....50%		No.....5 6 7 8	
Giant Truck Casters.....30%		Silvered Glass.....net		Star Metal Plug, new list.....40%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Stationary Truck Casters.....50&10%		White Enamel.....net		Lockport, Metal Plug, reduced list.....60%		No.....0 1 2 3 4	
Socket Truck Casters.....50%		<b>Cutlery—</b>		Metallic Key, Leather Lined.....60&10%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
<b>Cattle Leaders—</b>		Beaver Falls & Booth's.....35%		Cork Lined.....70&5&70&10%		No.....5 6 7 8	
Humason, Beckley & Co.'s.....70%		Wootenholme.....\$7.75 to 2		Burnside's Red Cedar.....60%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Sargent's.....60%&60&10%		<b>Dampers, &amp;c—</b>		Furnace's Red Cedar, bbl lots.....50&10%		No.....0 1 2 3 4	
Hotchkiss.....30%		Dampers, Buffalo.....50%		John Sommers.....50%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Peck, Stow & W. Co.....50&10%		Buffalo Damper Clips.....50%		Peerless Best Block Tin Key.....40%		No.....5 6 7 8	
<b>Chain—</b>		Crown Damper.....40%		IXL, list quality, Cork Lined.....50%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 6-1/2-10-2, exact.....50&10&50&10&5%		Excelcior.....40&10%		Diamond Lock.....40%		No.....0 1 2 3 4	
Trace, 6-1/2-10-3, exact.....50&10&50&10&5%		<b>Dividers—</b>		Perfection, Fla. Red Cedar.....50%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-2, exact.....50&10&50&10&5%		See Compasses.		Goodenough Cedar.....50%		No.....5 6 7 8	
Trace, 7-10-3, exact.....50&10&50&10&5%		<b>Dog Collars—</b>		Refractory Cork Lined.....50%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-4, exact.....50&10&50&10&5%		Embossed, Gilt, Pope & Steven's list.....30&10%		Western Pattern Cork Lined.....50%		No.....0 1 2 3 4	
Trace, 7-10-5, exact.....50&10&50&10&5%		Leather, Pope & Steven's list.....40%		Self-Measuring		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-6, exact.....50&10&50&10&5%		Brass, Pope & Steven's list.....40%		Enterprise, \$ doz \$50.00.....20&10%		No.....5 6 7 8	
Trace, 7-10-7, exact.....50&10&50&10&5%		<b>Door Springs—</b>		Lane's, \$ doz \$36.00.....25&10%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-8, exact.....50&10&50&10&5%		Torrey's Rod, regular size.....\$ doz \$1.30		Victor, \$ doz \$36.00.....25&10%		No.....0 1 2 3 4	
Trace, 7-10-9, exact.....50&10&50&10&5%		Gray's, \$ gr.....\$20.00		Felloe Plates.....\$ b 60¢&60¢&4%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-10, exact.....50&10&50&10&5%		Bee Rod \$ gr.....\$20.00		<b>Fifth Wheels—</b>		No.....5 6 7 8	
Trace, 7-10-11, exact.....50&10&50&10&5%		Warner's No. 1, \$ doz \$2.50; No. 2, \$3.30.....40&10&50%		Derby and Cincinnati.....4¢&1%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-12, exact.....50&10&50&10&5%		Gem (Coll), list April 19, 1888.....10%		<b>Files—</b>		No.....0 1 2 3 4	
Trace, 7-10-13, exact.....50&10&50&10&5%		Star (Coll), list April 19, 1888.....20%		Domestic—		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-14, exact.....50&10&50&10&5%		Victor (Coll).....60&60&10%		Nicholson Files, Rasps, &c.....60&10&60%		No.....5 6 7 8	
Trace, 7-10-15, exact.....50&10&50&10&5%		Champion (Coll).....60&10&60&10&10%		Nicholson (X. F.) Files.....25%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-16, exact.....50&10&50&10&5%		Philadelphia, 5 in., \$5.00; 8 in., \$7.75.....10%		Nicholson's Royal Files (Seconds).....75%		No.....0 1 2 3 4	
Trace, 7-10-17, exact.....50&10&50&10&5%		Cowell's.....No. 1, \$ doz \$18.00; No. 2, \$15.00.....50%		(extra prices on certain sizes)		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-18, exact.....50&10&50&10&5%		Rubber, complete, \$ doz \$4.50.....55&10%		Fair brands.....60&10&60&10&10%		No.....5 6 7 8	
Trace, 7-10-19, exact.....50&10&50&10&5%		Hercules.....50%		Second quality.....70&10&70&10%		\$ doz \$5.00 \$5.75 \$6.25 \$6.75 \$7.25	
Trace, 7-10-20, exact.....50&10&50&10&5%		Shaw Door Check and Spring.....25&30&35%					

<b>Cross-Cut Saw Handles—</b>	
Atkins No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.	
Boynston's Loop Saw Handles, 50¢.	60¢
Champion.....	15¢
<b>Hangers—</b>	
Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England.....	60¢10¢10¢70¢
Samson Steel Anti-Friction.....	55¢
Oreanna Steel.....	55¢
Hamilton Wrought Wood Track.....	55¢
U. S. Wood Track.....	55¢
Champion.....	60¢10¢
Rider and Wooster, Medina Yfg. Co.'s list.....	70¢
Climax Anti-Friction.....	60¢
Climax Anti-Friction for Wood Track.....	35¢
Zenith for Wood Track.....	55¢
Reed's Steel Arm.....	55¢
Challenge, Barn Door.....	50¢
Stirling's Improved (Anti-Friction).....	65¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	50¢25¢
Nickel.....	50¢10¢
Kidder's.....	50¢10¢
The Boss.....	50¢10¢
Best Anti-Friction.....	60¢10¢
Duplex (Wood Track).....	60¢10¢5¢
Terry's Pat., 7 doz pr. 4 in. \$10.00; 5 in. \$12.00.....	50¢50¢10¢
Crunk's Pat., No. 4, \$12.00; No. 5, \$14.40.....	50¢15¢20¢
No. 6, \$18.00.....	50¢
Wood Track Iron Clad, 7 ft. 10¢.....	50¢
Carrier Steel Anti-Friction.....	50¢50¢5¢
Architect, 7 set \$6.00.....	20¢
Eclipse.....	20¢10¢
Felix, 7 set \$4.50.....	20¢
Richards.....	30¢60¢10¢
Lane's Steel Anti-Friction.....	40¢10¢
Ball Bearing Door Hanger.....	20¢10¢25¢10¢
Warner's Pat.....	20¢20¢10¢
Stearns' Anti-Friction.....	20¢20¢10¢
Stearns' Challenge.....	25¢10¢25¢10¢10¢
Faulkner.....	40¢40¢25¢
American, 7 set \$6.00.....	30¢10¢
Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Paragon, Nos. 5, 5½, 7 and 8.....	20¢10¢
Crescent.....	60¢60¢10¢
Nickel, Cast Iron.....	50¢
Nickel, Malleable Iron and Steel.....	50¢
Scranton Anti-Friction Single Strap.....	35¢
Scranton Anti-Friction Double Strap.....	40¢
Universal Anti-Friction.....	40¢
Wild West, 4 in. Wheel, \$15.00; 5 in. \$17.00.....	45¢
Star.....	40¢10¢40¢10¢25¢
May.....	50¢50¢50¢10¢
Barry, \$6.00.....	40¢10¢
<b>Harness Snaps—</b>	
<b>See Snaps.</b>	
<b>Hatchets—</b>	
<b>List Jan. 1, 1888.</b>	
Isaiah Blood.....	35¢40¢
Hunt's Shingling, Lath and Claw.....	40¢5¢
Hunt's Broad.....	40¢10¢
Buffalo Hammer Co.....	40¢10¢50¢
Hurd's.....	40¢10¢50¢
Fayette R. Plumb.....	40¢10¢50¢
Wm. Mann, Jr., & Co.....	50¢40¢5¢
Underhill Edge Tool Co.....	40¢50¢30¢10¢
Underhill's, Haines and Bright.....	40¢10¢
C. Hammond & Son.....	40¢10¢50¢
Simmons.....	40¢10¢40¢10¢5¢
Peck's.....	40¢10¢40¢10¢5¢
Kelly's.....	50¢50¢5¢
Sargent & Co.....	50¢
Ten Eyck Edge Tool Co.....	40¢10¢40¢10¢5¢
Collins.....	50¢50¢5¢
Schulte, Lohoff & Co.....	50¢50¢5¢
<b>Hay and Straw Knives—</b>	
<b>Lightning, Mfrs. price 7 doz \$18.00, 25¢</b>	
<b>But jobbers frequently give extras.</b>	
Gem.....	40¢75¢40¢10¢
Wadsworth's.....	40¢75¢40¢10¢
Carter's Needle.....	7 doz \$11.50 \$12.00
Heath's.....	7 doz \$13.50 \$14.00
Auburn Hay, Com. and Spear Point.....	50¢
Auburn, Straw.....	40¢
Nolin's Hay.....	7 doz \$10.00
<b>Hinges—</b>	
<b>Wrought Iron Hinges</b>	
Strap and T.....	75¢5¢75¢10¢
Screw Hook and.....	6 to 12 in., 7¢ 3¢4¢
Strap.....	14 to 20 in., 7¢ 3¢4¢
Strap.....	22 to 36 in., 7¢ 3¢4¢
Heavy Welded.....	6 to 12 in., 7¢ 3¢4¢
Hook.....	14 to 20 in., 7¢ 3¢4¢
Hook.....	22 to 36 in., 7¢ 3¢4¢
Screw Hook.....	7 in., 7 doz \$1.50
and Eye.....	7 in., 7 doz \$2.45 10¢
7 in., 7 doz \$3.50.....	10¢
Rolled Blind Hinges, Nos. 22 and 24.....	50¢10¢
Rolled Blind Hinges, Nos. 22 and 24.....	50¢10¢
Rolled Plate.....	70¢10¢
Rolled Raised.....	70¢10¢
Plate Hinges, 8, 10 & 12 in., 7¢ 3¢4¢	5¢
"Providence" over 12 in., 7¢ 3¢4¢	5¢
<b>Spring Hinges—</b>	
Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co.'s list, March, 1888.....	20¢
Aome and U. S.....	30¢
Empire and Crown.....	20¢
Hero and Monarch.....	20¢
American, Gem, and Star, Japaned.....	50¢
American, Gem, and Star, Bronzed.....	50¢
Oxford, Bronze and Brass.....	50¢
Barker's Double Acting.....	20¢10¢
Union Mfg. Co.....	25¢
Bommer's.....	30¢
Buckman's.....	10¢20¢
Chicago.....	30¢
Wiles.....	10¢
Devore's.....	40¢
Rex.....	40¢
Royal.....	60¢
Reliable.....	60¢
Champion.....	60¢
<b>Gate Hinges—</b>	
Western.....	7 doz \$4.40, 60¢
N. E.....	7 doz \$7.00, 55¢
N. E. Reversible.....	7 doz \$5.20, 55¢10¢5¢
Clark's, Nos. 1, 2, 3.....	60¢10¢5¢
N. Y. State.....	7 doz \$12.50, 60¢
Automatic.....	7 doz \$12.50, 60¢
Common Sense.....	7 doz \$12.50, 60¢
Seymour's.....	45¢10¢
Shepard's.....	60¢10¢5¢
Reed's Latch and Hinges.....	7 doz \$12.00, 50¢
<b>Blind Hinges—</b>	
Parker.....	75¢25¢
Palmer.....	50¢50¢10¢
Seymour.....	70¢25¢
Nicholson.....	45¢10¢
Huffer.....	50¢
Clark's, Nos. 1, 3, 5, 40 and 50.....	75¢10¢50¢80¢
Clark's Mortise Gravity.....	50¢
Sargent's, Nos. 1, 3, 5, 11, 13.....	75¢10¢55¢10¢5¢
Sargent's, No. 12.....	77¢10¢10¢
Reading's Gravity.....	75¢10¢75¢10¢25¢
Shepard's.....	75¢10¢55¢
Noiseless.....	75¢10¢55¢
Niagara.....	80¢25¢
Buffalo.....	80¢25¢
Clark's Genuine Pat.....	80¢25¢
O. S., Lull & Porter.....	75¢10¢
Acme, Lull & Porter.....	75¢10¢
Queen City Reversible.....	75¢
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....	75¢10¢25¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....	25¢25¢
<b>Hoes—</b>	
<b>Handled—</b>	
Garden, Mortar, &c.....	65¢
Planter's, Cotton, &c.....	65¢
Warren Hoe.....	65¢
Magic.....	7 doz \$0.00
<b>Eye—</b>	
D. & H. Scovill.....	20¢
Lane's Crescent Planter's Pattern.....	45¢5¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢5¢
Sandusky Tool Co., S. & O. Pat.....	60¢
Hubbard & Co., S. & O. Pat.....	60¢
Chattanooga Tool Co., S. & O. Pat.....	60¢
Grub.....	60¢60¢10¢
<b>Hog Rings and Rings—</b>	
Hill's Improved Rings.....	7 doz \$4.25
Hill's Old Style Rings.....	7 doz \$2.75
Hill's Tongs.....	7 doz \$4.50
Hill's Rings.....	7 doz \$2.15 \$2.25
Perfect Rings.....	7 doz \$2.15 \$2.25
Perfect Rings.....	7 doz \$2.15 \$2.25
Blair's Hog Rings.....	7 doz \$2.25 \$2.50
Blair's Hog Rings.....	7 doz \$2.25 \$2.50
Champion Rings.....	7 doz \$2.00
Champion Rings, Double.....	7 doz \$2.25
Brown's Rings.....	7 doz \$1.25 \$1.30
<b>Holding Apparatus—</b>	
Moore's Hand Holst, with Lock.....	20¢
Moore's Differential Pulley Block.....	40¢
Energy Mfg. Co's.....	25¢
<b>Holders, File and Tool—</b>	
Bals Pat.....	7 doz \$4.00; 25¢
Nicholson File Holders.....	20¢
<b>Hollow-Ware—</b>	
<b>Iron—</b>	
Stove Hollow-Ware—	
Ground.....	60¢60¢5¢
Unground.....	60¢10¢60¢10¢10¢
Enameled Hollow-Ware—	
Maslin Kettles.....	65¢10¢
Boilers and Saucepans.....	40¢5¢
Tinned Boilers and Saucepans.....	40¢
Gray Enameled-Ware.....	50¢50¢5¢
Stove.....	50¢50¢5¢
Maslin Kettles.....	60¢10¢60¢10¢10¢
Boilers and Saucepans.....	40¢5¢
Agate and Granite Ware, old list.....	25¢
Rustless Hollow-Ware.....	50¢50¢5¢
Galvanized Tea-Kettles—	
Each.....	6 7 8 9
Each.....	55¢ 60¢ 65¢ 75¢
<b>Silver Plated—</b>	
4 mo. or 5 ½ cash in 30 days.....	
Reed & Barton.....	40¢5¢
Meriden Britannia Co.....	40¢5¢
Simpson, Hall, Miller & Co.....	40¢5¢
Rogers & Bros.....	40¢5¢
Hartford Silver Plate Co.....	40¢5¢
William Rogers Mfg. Co.....	40¢5¢
<b>Hooks—</b>	
<b>Cast Iron—</b>	
Bird Cage, Sargent's list.....	60¢10¢10¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢60¢10¢10¢
Clothes Line, Reading list.....	60¢10¢60¢10¢10¢
Ceiling, Sargent's list.....	60¢10¢60¢10¢10¢
Harness, Reading list.....	60¢10¢60¢10¢10¢
Coat and Hat, Sargent's list.....	60¢10¢60¢10¢10¢
Coat and Hat, Reading.....	60¢10¢60¢10¢10¢
<b>Wrought Iron—</b>	
Cotton.....	7 doz \$1.25
Cotton Pat. (N. Y. Mallet & Handle Wks.).....	30¢
Tassel and Picture (T. & S. Mfg. Co.).....	50¢
Wrought Staples, Hooks, &c.....	See Wrought Goods.
<b>Wire—</b>	
Wire Coat and Hat, Gem, list April, 1886.....	45¢
Wire Coat and Hat, Miles, list April, 1886.....	45¢
Indestructible Coat and Hat.....	45¢
Wire Coat and Hat, Standard.....	75¢10¢80¢
<b>Miscellaneous.</b>	
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.....	50¢
Nolin's Grass.....	50¢
Bush.....	55¢60¢
Whitcomb-Patent.....	55¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	60¢10¢10¢
Fish Hooks, American.....	50¢
Bench Hooks.....	See Bench Stops.
<b>Horse Nails—</b>	
Nos. 6 7 8 9 10.....	
Ausable.....	25¢ 25¢ 25¢ 24¢ 23¢
Lyra.....	25¢10¢25¢10¢10¢
Clinton, Fin.....	24¢ 22¢ 21¢ 20¢ 19¢
Essex.....	25¢ 25¢ 25¢ 24¢ 23¢
Snowden.....	25¢ 23¢ 22¢ 21¢ 20¢
Putnam.....	23¢21¢ 20¢ 19¢ 18¢
Vulcan.....	1000 lb in year 15¢
Northwest.....	25¢ 23¢ 22¢ 21¢ 20¢
Globe.....	23¢ 21¢ 20¢ 19¢ 18¢
Boston.....	23¢ 21¢ 20¢ 19¢ 18¢
A. C.....	25¢ 23¢ 22¢ 21¢ 20¢
C. B.-K.....	25¢ 23¢ 22¢ 21¢ 20¢
Champlain.....	25¢ 23¢ 22¢ 21¢ 20¢
New Haven.....	25¢ 23¢ 22¢ 21¢ 20¢
Saranac.....	25¢10¢25¢10¢10¢
Champion.....	25¢ 23¢ 22¢ 21¢ 20¢
Capewell.....	25¢ 23¢ 22¢ 21¢ 20¢
Star.....	23¢ 21¢ 20¢ 19¢ 18¢
Anchor.....	23¢ 21¢ 20¢ 19¢ 18¢
Western.....	23¢ 21¢ 20¢ 19¢ 18¢
Empire Bronzed.....	14¢ 13¢
<b>Horse Shoes—See Shoes Horse.</b>	
<b>Hose, Rubber—</b>	
Competition.....	75¢10¢75¢10¢5¢
Standard.....	70¢70¢10¢
N. Y. & P. Co., Para.....	60¢60¢10¢
N. Y. & P. Co., Extra.....	30¢10¢
N. Y. & P. Co., Dundee.....	60¢10¢5¢
<b>Huskers—</b>	
Blair's Adjustable.....	7 gr \$8.00
Blair's Adjustable Clipper.....	7 gr 7.00
<b>Indurated Fiber-Ware.</b>	
Spittoons, No. 2, 7 doz.....	\$3.75
Basins, Ringed, 7 doz, No. 1, \$3.70; No. 2, \$3.10; No. 3.....	\$2.70
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 7 doz. nests.....	\$18.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 7 doz. nests.....	\$8.37
Butter Bowls, 16, 17 and 19-inch (3 pieces), 7 doz. nests.....	\$6.75
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) 7 set.....	\$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), 7 set.....	\$2.25
<b>See also Falls.</b>	
<b>Jack Screws—See Screws.</b>	
<b>Kettles—</b>	
Brass, 7 to 17 in., 7 doz.....	24¢ 21¢
Brass larger than 17 in., 7 doz.....	28¢ 23¢
<b>Enameled and Tea Kettles.</b>	
<b>See Hollow-Ware.</b>	
<b>Keys—</b>	
Lock Ass'n list Dec. 30, 1886.....	50¢10¢
Eagle, Cabinet, &c.....	33¢42¢
Hotchkiss' Brass Blanks.....	40¢
Hotchkiss, Copper and Tinned.....	40¢
Hotchkiss' Pad, and Cab.....	35¢
Ratchet Bed Keys.....	7 doz \$4.00, 15¢
Wollensack Tinned.....	50¢10¢
<b>Knife Sharpeners—</b>	
Parkin's.....	
Applewood Handles.....	7 doz \$6.00, 40¢
Rosewood or Cocobolo.....	7 doz \$9.00, 40¢
<b>Knives—</b>	
Wilson's Butcher Knives.....	25¢30¢
Ames' Butcher Knives.....	25¢
Foster Bros' Butcher, &c.....	40¢
Nichols' Butcher Knives.....	40¢10¢
Ames' Shoe Knives.....	20¢25¢
Ames' Bread Knives.....	7 doz \$1.50, 16¢20¢
Moran's Shoe and Bread.....	20¢
Hay and Straw.....	See Hay Knives.
Table and Pocket.....	See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.....	\$2.00
Corn, Auburn Mfg. Co. Crescent.....	\$3.50
<b>Knobs—</b>	
Door Mineral.....	65¢68¢
Door Por. Jap'd.....	75¢78¢
Door Por. Nickel.....	\$2.00 \$2.25
Door Por. Picked Nickel.....	\$2.00 \$2.25
Hemlock Door Knobs.....	60¢10¢60¢10¢10¢
Yale & Towne Wood, list Dec. 1885.....	40¢
Furniture Plain.....	75¢ gro inch, 10¢
Furniture, Wood Screws.....	25¢10¢
Base, Rubber Tip.....	70¢10¢5¢
Picture, Judd's.....	60¢10¢10¢70¢
Picture, Sargent's.....	70¢10¢
Picture, Hemlock.....	55¢5¢
Shutter, Porcelain.....	65¢10¢
Carriage, Jap.....	7 gro 80¢, 60¢10¢
<b>Ladles—</b>	
Melting, Sargent's.....	55¢10¢
Melting, Reading.....	35¢10¢
Melting, Monroe's Pat.....	7 doz \$4.00, 40¢
Melting, P. S. & W.....	35¢10¢40¢
Melting, Warner's.....	30¢
<b>Lawn Mowers—</b>	
Standard list.....	50¢10¢
Quaker City.....	60¢10¢
Enterprise.....	60¢10¢
<b>Lanterns—</b>	
<b>Tubular—</b>	
Plain with Guards, 7 doz.....	\$4.00 \$4.25
Lift Wire, with Guards.....	\$4.50 \$4.75
Square Plain, with Guards.....	\$4.00 \$4.25
Sq. Lift Wire, with Guards.....	\$4.25 \$4.50
Without Guards, 25¢ 7 doz less.....	
<b>Miscellaneous.</b>	
Police, Small, \$5.00; Medium, \$7.25; Large, \$9.75.....	20¢25¢
<b>Perman Squeezers—</b>	
Lemon Liner, No. 1.....	7 doz \$6.00, 25¢30¢
Wood, No. 2.....	7 doz \$3.00, 35¢
Wood, Common.....	7 doz \$1.70 \$1.75
Dunlap's Improved.....	7 doz \$3.75, 20¢
Sammls.....	No. 1, \$5.00; No. 2, \$6.12
Jennings' Star.....	7 doz \$2.50
The Boss.....	7 doz \$2.50
Dean's, Nos. 1, 7 doz \$6.50; 2, \$3.35; 3, \$1.90.....	
Little Giant.....	50¢60¢5¢
King.....	40¢5¢
<b>Lines—</b>	
Cotton and Linen Fish, Draper's.....	50¢
Draper's Chalk.....	60¢
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....	25¢
Cotton Chalk.....	55¢
Samson, Cotton, No. 4, \$2; No. 4½, \$2.50; No. 5, \$3.....	10¢
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 5, \$8.50.....	25¢
Mason's Linen, No. 3½, \$1.50; No. 4, \$2.00; No. 4½, \$2.50.....	45¢
Mason's Colored Cotton.....	18 20
Wire Clothes.....	\$3.60 \$3.00 \$2.50
Ventilator Cord, Samson Braided, White or Drab Cotton.....	7 doz \$7.50, 20¢
<b>Locks, &amp;c.—</b>	
<b>Door Lock</b>	

<b>Machines—</b>	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
<b>Bench and Hand—</b>	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood.....	55¢10¢55¢10¢10¢
Bench, Wood, Hickory.....	55¢10¢55¢10¢10¢
Hand, Wood.....	55¢10¢55¢10¢10¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢55¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢55¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	50¢10¢50¢10¢55¢
Jack Screws, Stearns.....	40¢40¢10¢
<b>Scroll Saws—</b>	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers.....	35¢
Barnes' Scroll Saw Blades.....	35¢
Seymour's.....	50¢25¢
<b>Shears—</b>	
American (Cast) Iron.....	75¢10¢75¢10¢55¢
Pruning.....	See Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....	50¢10¢55¢
Tinners'.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢50¢10¢10¢55¢
Heinrich's Tailor's Shears.....	35¢45¢
First quality C. S. Trimmers.....	30¢50¢10¢
Second quality C. S. Trimmers.....	20¢10¢50¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢55¢
Howe Bros. & Hubert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	60¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickleled, same list.....	60¢
<b>Shavers—</b>	
Sliding Door.....	50¢10¢50¢55¢
M. W. Co., List July, 1888.....	55¢20¢
R. & E., List Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, List Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
<b>Sliding Shutter—</b>	
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
<b>Ship Tools—</b>	
L. & I. J. White.....	30¢25¢
Albertson Mfg. Co.....	25¢
<b>Shoes, Horse, Mule, &amp;c.—</b>	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add \$1 per keg to above prices.	
<b>Oz, Wrought—</b>	
Ton lots.....	\$ 9¢
1000 lb lots.....	\$ 9¢
500 lb lots.....	\$ 9¢
<b>Shot—</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 5 lb.....	\$1.16
Drop, 7 bag, 5 lb.....	30
Buck and Chilled, 7 25 lb bag.....	1.41
Buck and Chilled, 7 5 lb bag.....	.34
<b>Shovels and Spades—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1888.....	30¢
NOTE: Jobbers frequently give 5¢ to 7½¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢50¢10¢
Griffith's Solid C. S. R. E. Goods.....	30¢
Old Colony (Sard. Fork & Tool Co.).....	30¢
St. Louis Shovel Co.....	20¢20¢7½¢
Hussey, Binna & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢7½¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1889.....	30¢
Remington's (Lowmeyer's) Pat.....	50¢10¢40¢
Bowland's, Black Iron.....	50¢10¢
Bowland's Steel.....	60¢25¢60¢10¢
<b>Shovels and Tongs—</b>	
Iron Head.....	60¢10¢50¢10¢55¢
Brass Head.....	60¢10¢10¢
<b>Skins, Thimble—</b>	
Western list.....	75¢55¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	30¢
Coldbrookdale Iron Co.....	50¢10¢
Union P. S. T. Skins.....	60¢
Union Turned and Fitted.....	35¢
<b>Sieves—</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sifters.....	50¢25¢10¢
Electric.....	50¢25¢10¢
Hunter's.....	50¢25¢10¢
Smith's Adjustable Milk Strainer.....	50¢25¢10¢
Smith's Adjustable T. & C. Strainer.....	50¢25¢10¢
<b>Stoves, Wooden Rim—</b>	
Mesh 18, Nested, 7 doz.....	70¢
Mesh 20, Nested, 7 doz.....	85¢
Mesh 24, Nested, 7 doz.....	\$1.00
Mesh 24, Nested, 7 doz.....	1.10
<b>Stoves—</b>	
School, by case.....	40¢
<b>Snaps, Harness, &amp;c.—</b>	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢25¢
Covert, New Patent.....	50¢25¢25¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
<b>Soldering Irons—</b>	
Covert's Adjustable, list Jan. 1, 1886.....	35¢25¢
<b>Spoke Shaves—</b>	
Wood.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
<b>Spoke Trimmers—</b>	
Bonney's.....	50¢10¢50¢
Stearns.....	50¢10¢50¢
Ives', No. 1, \$15.00; No. 2, \$12.00.....	55¢10¢
Douglas.....	50¢25¢10¢
<b>Spoons and Forks—</b>	
Tinned Iron—	
Basting, Cen. Stamp, Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp, Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	35¢25¢
Silver-Plated—(4 mos. or 5¢ cash 30 days.)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bros.....	50¢
Reed & Barton.....	50¢10¢50¢
Wm. Rogers Mfg. Co.....	50¢10¢50¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢50¢
L. Boardman & Son.....	50¢10¢
<b>Miscellaneous—</b>	
Holmes & Edwards Silver Co.....	50¢10¢
No. 67 Mexican Silver.....	50¢10¢
No. 30 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 50 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢60¢5
German Silver, Hall & Elton.....	60¢25¢ cash
Nickel Silver.....	50¢25¢50¢10¢55¢ cash
Britannia.....	50¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case.....	60¢
lots.....	60¢
<b>Springs—</b>	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢55¢
Cliff's Bolster Springs.....	25¢
<b>Squares—</b>	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	60¢10¢50¢10¢
Try Square and T Bevels.....	210¢
Diston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢25¢
<b>Staples—</b>	
Fence Staples, Galvanized.....	Same price as F.R.B. Wire.
Fence Staples, Plain.....	See Trl. Rep.
<b>Steelyards—</b>	
40¢10¢50¢	
<b>Stocks and Dies—</b>	
Blacksmith's.....	30¢25¢30¢10¢
Waterford Goods.....	30¢25¢30¢10¢
Butterfield's Goods.....	30¢25¢30¢10¢
Lighting Screw Plate.....	25¢30¢
Reeco's New Screw Plates.....	35¢45¢40¢
<b>Stone—</b>	
Hindustan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢	
Sand Stone.....	\$ 2½¢
Washita Stone, Extra.....	\$ 14½¢
Washita Stone, No. 1.....	\$ 10¢11¢
Washita Stone, No. 2.....	\$ 10¢11¢
Washita Slips, No. 1, Extra.....	\$ 24¢38¢
Washita Slips, No. 1.....	\$ 24¢38¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$ 1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$ 1.85
Turkey Oil Stone, 4 to 8 in.....	\$ 1.00
Turkey Slips.....	\$ 1.00
Lake Superior Chasse.....	\$ 1.16
Lake Superior Slips, Chasse.....	\$ 31¢32¢
Seneca Stone, Red Paper Brand.....	18¢20¢
Seneca Stone, High Rounds.....	\$ 20¢35¢
Seneca Stone, Small White.....	\$ 20¢35¢
<b>Steve Polish—</b>	
Joseph Dixon's.....	50¢25¢10¢
Gem.....	50¢25¢10¢
Gold Medal.....	50¢25¢10¢
Mirror.....	50¢25¢10¢
Lustr.....	50¢25¢10¢
Ruby.....	50¢25¢10¢
Rising Sun, 5 gro lots.....	50¢25¢10¢
Dixon's Plumbago.....	50¢25¢10¢
Boynton's Noon Day.....	50¢25¢10¢
Parlor Pride Stove Enamel.....	50¢25¢10¢
Yates Liquid.....	50¢25¢10¢
Yates Standard Paste Polish, 10 lb cans.....	50¢25¢10¢
Jet Black.....	50¢25¢10¢
Japanese.....	50¢25¢10¢
Flreside.....	50¢25¢10¢
Diamond O. K. Enamel.....	50¢25¢10¢
Bonelli's Liquid Stove Polish.....	50¢25¢10¢
Bonelli's Paste Stove Polish.....	50¢25¢10¢
Black Eagle Benzine Paste, 5 and 10 lb cans.....	50¢25¢10¢
Black Jack Water Paste, 5 and 10 lb cans.....	50¢25¢10¢
Nickel Plate Paste.....	50¢25¢10¢
<b>Tacks, Brads, &amp;c.—</b>	
List, Jan. 2, 1888. (Note: Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢55¢
Steel Carpet.....	80¢80¢55¢
Swedes Iron Carpet.....	80¢80¢55¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron.....	75¢10¢75¢10¢55¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢55¢
Gimp and Lace.....	75¢10¢75¢10¢55¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢55¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢55¢
Swedes Iron Miners.....	75¢10¢75¢10¢55¢
Swedes Iron Bill Posters.....	75¢10¢75¢10¢55¢
Swedes Steel (Swedes Iron price list).....	80¢80¢55¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
<b>Common and Patent Brads, 70¢10¢70¢10¢10¢</b>	
Hungarian Nails.....	70¢10¢70¢10¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢55¢
Cigar Box Nails.....	50¢10¢50¢10¢55¢
Picture-Frame Points.....	50¢10¢50¢10¢55¢
Looking-Glass Points.....	50¢10¢50¢10¢55¢
Leathered Carpet.....	50¢10¢50¢10¢55¢
Brush Tacks.....	50¢10¢50¢10¢55¢
Shoe Finders, List Jan. 2, 1888.....	10¢10¢55¢
<b>Lining and Saddle Nails, List Jan. 1, 1886</b>	
Silvered.....	30¢10¢10¢
Japanned.....	30¢10¢10¢
Double-Pointed Tacks.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.....	50¢10¢
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....	50¢10¢
<b>Tap Borers—</b>	
Common and Rind.....	30¢10¢
Ive's Tap Borers.....	35¢25¢
Enterprise Mfg. Co.....	30¢10¢30¢
Clark's.....	35¢35¢35¢
<b>Tapes, Measuring—</b>	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
<b>Thermometers—</b>	
Tin Case.....	80¢80¢10¢
<b>Thimble Skins—See Skins.</b>	
<b>Ties, Bale-Steel</b>	
Standard Wire, list.....	50¢10¢55¢
<b>Tinners' Shears, &amp;c.—</b>	
Shears and Snips (P. S. & W.).....	30¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	35¢45¢
<b>Tinware—</b>	
Stamped, Japanned and Plated, list Jan. 20 1887.....	75¢75¢55¢
<b>Tire Benders, Upsetters, &amp;c.—</b>	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
<b>Tobacco Cutters—</b>	
Champion.....	20¢10¢30¢
Wood Bottom.....	50¢25¢50¢25¢
All Iron.....	50¢25¢
Nashua Lock Co.'s.....	50¢25¢
Wilson's.....	50¢25¢
Sargent's.....	50¢25¢
Acme.....	50¢25¢
<b>Transom Lifters—</b>	
Wollensak's:	
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	25¢
Skylight Lifters.....	25¢
Crown, Eagle and Shield.....	50¢
Reith's, list Jan. 1, 1887.....	50¢10¢25¢
Bronzed Iron Rods.....	50¢10¢25¢
Brass, Real Bronze or Nickel Plate.....	50¢10¢25¢
Excelsior.....	50¢10¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
<b>Traps—</b>	
Game—	
Newhouse.....	35¢40¢55¢
Onedia Pattern.....	70¢70¢25¢
Game, Blake's Patent.....	40¢10¢55¢
Mouse and Rat—	
Mouse Wood Choker.....	11¢12¢
Mouse, Round Wire.....	50¢25¢10¢
Mouse, Cage Wire.....	50¢25¢10¢
Mouse, Catch-em-alive.....	50¢25¢10¢
Mouse, "Bonanza".....	50¢25¢10¢
Mouse Delusion.....	50¢25¢10¢
Rat, "Decoy".....	50¢25¢10¢
Ideal.....	50¢25¢10¢
Cyclone.....	50¢25¢10¢
Hotchkiss Metallic Mouse, 5-hole traps.....	50¢25¢10¢
In full cases.....	50¢25¢10¢
<b>Trowels—</b>	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diston's Brick and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢30¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
<b>Triers—</b>	
Butter and cheese.....	25¢
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co.'s list '82.....	40¢
<b>Tubes, Boiler—</b>	
See Pipe.....	
<b>Twine—</b>	
Flat Twine—	
No. 9, 1/4 and 1/2 B. Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B. Balls.....	21¢ 30¢
No. 18, 1/4 and 1/2 B. Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 B. Balls.....	18¢ 28¢
No. 30, 1/4 and 1/2 B. Balls.....	16¢ 27¢
Chalk Line, Cotton, 1/4 and 1/2 B. Balls.....	45¢50¢
Mason Line, Linen, 1/4 B. Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B. Balls (Spring Twine).....	11¢14¢
3-Ply Hemp, 1/4 B. Balls.....	12¢12¢4¢
3-Ply Hemp, 1/2 B. Balls.....	14¢11¢14¢
Cotton Wrapping, 5 Balls to a lb.....	15¢10¢14¢
2, 3, 4 and 5-Ply Jute, 1/4 B. Balls.....	10¢
Wool.....	8¢10¢63¢
Paper.....	18¢11¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
<b>Vices—</b>	
Solid Block.....	60¢60¢55¢
Parallel—	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
<b>Parker's.....</b>	
Wilson's.....	20¢25¢
Howard's.....	55¢
Bonney's.....	40¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢25¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	30¢
<b>Saw Filers—</b>	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	35¢42¢10¢55¢10¢10¢
Stearns' Silent Saw Vises.....	35¢42¢
Sargent's.....	60¢42¢10¢
Hopkins.....	50¢17¢50¢10¢
Reading.....	40¢10¢
Wentworth.....	30¢10¢
Combination Hand Vises.....	50¢10¢
Cowell Hand Vises.....	30¢
Bauer's Pipe Vises.....	10¢
<b>Wagon Boxes—</b>	



**Melasses Gates—**  
 Stebbin's Pat. 70¢ 70¢ 70¢  
 Stebbin's Genuine 60¢ 10¢ 10¢  
 Stebbin's Tinned Ends 40¢ 10¢  
 Chase's Hard Metal 50¢ 10¢  
 Bush's 30¢  
 Lincoln's Pattern 70¢ 70¢ 10¢  
 Weed's 30¢ 10¢  
 Bost. # dos:  
 No. 1, 7¢; No. 2, 8¢; No. 3, 9¢; No. 4, 10¢  
**Money Drawers—** # dos. \$18.00  
**Muzzles—**  
 Safety # dos. \$3.00, 25¢

**Nails, see Trade Report.**  
 Wire Nails & Brads, list July 14, '87  
 Wire Nails, Standard Penny 70¢ 10¢  
**Nail Puller—**  
 Curtis Hammer # dos \$0.00  
 Giant, No. 1 # dos \$0.00, 10¢  
 Pelican # dos \$0.00, 25¢  
 Boss # dos \$0.00, 30¢  
 Lightning # dos \$21.00

**Nail Sets—**  
 Square # gr. \$4.00 to \$4.25  
 Round # gr. \$3.25  
 Cannon's Diamond Point # gr. \$12, 20¢  
**Nut Crackers—**  
 Table (H. & B. Mfg. Co.) 40¢  
 Blake's Pattern # dos \$2.00, 10¢  
 Turner & Seymour Mfg. Co. 50¢

**Nuts—**  
 Nuts, off list Jan. 1, 1888: Square, Hex.  
 Hot Pressed 5¢ 5¢  
 Cold Punched 5¢ 5¢  
 In lots less than 100 lb, # 5, add 1¢; 1-lb boxes, add 1¢ to list.

**Oakum—**  
 Government # 7 1/2 @ 8¢  
 U. S. Navy # 5 1/2 @ 7¢  
 Navy # 5 1/2 @ 6 1/2¢

**Oilers—**  
 Zinc and Tin 65¢ 65¢ 10¢  
 Brass and Copper 50¢ 10¢ 10¢  
 Malleable, Hammers, Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 # dos.  
 Malleable, Hammers, Old Pattern, same list 10¢ 10¢ 10¢  
 Prior's Pat. or "Paragon" Zinc 40¢  
 Prior's Pat. or "Paragon" Brass 50¢  
 Olmsted's Tin and Zinc 60¢  
 Olmsted's Brass and Copper 50¢  
 Olmsted's Zinc 60¢  
 Olmsted's Brass 50¢

**Packing, Steam—**  
 Rubber—  
 Standard 60¢ 10¢ 60¢ 10¢ 10¢  
 Extra 50¢ 10¢ 60¢  
 N. Y. B. & P. Co., Standard 50¢ 10¢ 60¢  
 N. Y. B. & P. Co., Empire 70¢  
 N. Y. B. & P. Co., Salamander # 5 1/2, 30¢  
 Jenkins' Standard # 8 1/2, 35¢

**Miscellaneous—**  
 American Packing 10¢ 11¢ #  
 Russia Packing 14¢ #  
 Italian Packing 15¢ 16¢ #  
 Russian Packing 15¢ 16¢ #  
 Jute 7¢ 8¢ #

**Padlocks—**  
 See Locks.

**Pails—**  
 Galvanized Iron—  
 Quarts 10 12 14  
 Hill's Light Weight # dos. \$2.75 3.00 3.25  
 Hill's Heavy Weight # do. 3.00 3.25 3.75  
 Whiting's 2.75 3.00 3.25  
 Sawyer Shepard & Co. 2.80 3.00 3.40  
 Iron Clad 2.75 3.00 3.25  
 Fire Buckets 2.75 3.25 3.50  
 Buckets, see Well Buckets.

**Indurated Fibre Ware—**  
 Star Pails, 12 qt # dos \$4.50  
 Fire, Stable and Milk, 14 qt # dos \$5.25

**Pencils—**  
 Faber's Carpenters' high list 50¢  
 Faber's Round Gilt # gr \$0.35  
 Dixon's Lead # gr \$0.40  
 Dixon's Lumber # gr \$0.75  
 Dixon's Carpenters' 40¢ 10¢

**Picks—**  
 Railroad or Adze Eye, 5 to 6, \$12.00;  
 6 to 7, \$13.00 60¢ 60¢ 10¢

**Picture Nails—**  
 Brass Head, Sargent's list 50¢ 10¢ 10¢  
 Brass Head, Combination list 50¢ 10¢  
 Porcelain Head, Sargent's list 50¢ 10¢ 10¢  
 Porcelain Head, Combination list 40¢ 10¢  
 Niles' Patent 40¢

**Pinking Irons—** # dos 65¢ net  
**Pipe, Wrought Iron—**

List March 23, 1887.  
 1 1/2 and under, Plain 47¢ 45¢  
 1 1/2 and under, Galvanized 47¢ 45¢  
 1 1/2 and over, Plain 67¢ 45¢  
 1 1/2 and over, Galvanized 65¢  
 Boiler Tubes, Iron.  
 1 1/2 and under 57¢ 45¢  
 2 in. to 2 1/2 in. 62¢ 45¢  
 3 in. and larger 65¢

**Planes and Plane Irons—**  
 Wood Planes—  
 Molding 50¢ 50¢ 50¢ 10¢  
 Bench, First Quality 60¢ 60¢ 50¢  
 Bench, Second Quality 60¢ 10¢ 60¢ 10¢ 10¢  
 Bailey's (Stanley R. & L. Co.) 40¢ 10¢

**Iron Planes—**  
 Bailey's (Stanley R. & L. Co.) 40¢ 10¢  
 Miscellaneous Planes (Stanley R. & L. Co.) 30¢ 10¢  
 Victor Planes (Stanley R. & L. Co.) 30¢ 10¢  
 Steer's Iron Planes 30¢ 10¢  
 Meriden Mfg. Co.'s 30¢ 10¢ 30¢ 10¢ 10¢  
 Davis's Iron Planes 30¢ 10¢ 30¢ 10¢ 10¢  
 Birmingham Plane Co. 50¢ 50¢ 50¢  
 Gage Tool Co.'s Self-Setting 20¢ 10¢  
 Chapin's Iron Planes 40¢ 40¢ 50¢  
 Sargent's 30¢ 10¢ 30¢ 10¢ 10¢

**Plane Irons—**  
 Plane Irons 30¢ 10¢  
 Plane Irons, Butcher's \$5.00 to \$5.25 to 2  
 Plane Irons, Buck Bros 30¢  
 Plane Irons, Auburn Tool Co., This tile 40¢  
 Sandusky Tool Co.:  
 Single and Cut 30¢  
 Double 40¢  
 L. & I. J. White 25¢

**Pliers and Nippers—**  
 Button's Patent 30¢ 10¢ 40¢  
 Hall's No. 2, 5 in., \$18.50; No. 4, 7 in. \$21.00 # dos 20¢ 10¢ 30¢ 10¢  
 Humason & Beckley Mfg. Co. 50¢ 60¢ 10¢  
 Gas Pliers 30¢  
 Gas Pliers, Gustaf's Nickel Plated 60¢ 50¢  
 Eureka Pliers and Nippers 40¢  
 Russell's Parallel 25¢  
 P. S. & W. Cast Steel 50¢  
 P. S. & W. Tinnars' Cutting Nippers, add 6¢ dis 10¢  
 Carew's Pat. Wire Cutters # dos \$12.00, 30¢ 50¢  
 Morrill's Parallel # dos \$12.00, 30¢ 50¢  
 Cronk's 6 in., \$15.00; 10 in. \$21.00 40¢ 40¢ 50¢

**Plumbs and Levels—**  
 Regular List 70¢ 10¢ 70¢ 10¢ 10¢  
 Diastion's 45¢ 10¢  
 Pocket Levels 70¢ 10¢ 70¢ 10¢ 10¢  
 Davis Iron Levels 30¢  
 Davis' Inclinoimeters 10¢ 10¢

**Polish, Metal.**  
 Prestoline 30¢ 10¢  
 Krestoline Paste 35¢ 45¢  
 Gaston's Silver Compound 35¢ 45¢  
**Pokes, Animal—**  
 Bishop's I. X. L. # dos \$0.50  
 Bishop's O. K. # dos \$0.50  
 Bishop's Pioneer # dos \$0.75  
 Bishop's American # dos \$0.50

**Peppers, Corn—**  
 Round or Square, 1 qt. # gr \$12.00 to \$15.00  
 Round or Square, 2 qt. # gr \$25.00 to \$30.00

**Pest Hole and Tree Augers and Diggers—**  
 Samson Post Hole Digger # dos \$36.00, 25¢ 10¢

**Fletcher Post Hole Augers, # dos \$36, 20¢**  
 Eureka Diggers # dos \$18.00 to \$17.00  
 Lead's # dos \$5.00 to \$6.00  
 Vaughan's Post Hole Auger # dos \$13.00 to \$14.00  
 Kohler's Little Giant # dos \$15.00  
 Kohler's Hercules # dos \$15.00  
 Kohler's New Champion # dos \$20.00  
 Schneider # dos \$18.00  
 Ryan's Post Hole Diggers # dos \$24.00  
 Cronk's Post Hole Auger # dos \$20.00  
 Gibbs Post Hole Digger # dos \$30.00, 50¢  
 Imperial # dos \$15

**Potato Parers—**  
 White Mountain # dos \$5.00 to \$5.50  
 Antrim Combination # dos \$8.00  
 Rootier # dos \$15.00

**Pruning Hooks and Shears—**  
 Diastion's Combined Pruning Hook and Saw # dos \$18.00, 20¢ 10¢  
 Diastion's Pruning Hook # dos \$12.00, 20¢ 10¢

**E. S. Lee & Co.'s Pruning Tools 40¢**  
 Pruning Shears, Henry's Pat # dos \$3.75 to \$4.00 net  
 Henry's Pruning Shears # dos \$4.25 to \$4.50 net  
 Wheeler, M. & C. Co.'s Combination # dos \$12.00, 20¢  
 Dunlap's Saw and Chisel # dos \$5.00, 30¢  
 J. Madison & Co., No. 1, \$5.25; No. 2, 7.25

**Palleys—**  
 Hot House, Awning, &c. 60¢ 10¢  
 Japanned Screw 60¢ 10¢  
 Brass Screw 60¢ 10¢  
 Japanned Side 60¢ 10¢  
 Japanned Clothes Line 60¢ 10¢  
 Empire Sash Pulley 50¢ 10¢  
 Moore's Sash, Anti-Friction 50¢  
 Hay Fork, Solid Eye, \$4.00; Swivel \$4.50 50¢ 10¢ 50¢ 10¢ 50¢  
 Hay Fork, "Anti-Friction" 5 in. Solid \$5.70 50¢ 10¢  
 Hay Fork, "F" Common and Pat. 50¢  
 Hay Fork, Embued 50¢  
 Hay Fork, Tarbox Pat. Iron 50¢  
 Hay Fork, Reed's Self-Lubricating 50¢  
 Shade Rack 45¢  
 Tackle Blocks See Blocks  
 Moore's Anti-Friction 5 in. Wheel # dos \$12.00 40¢

**Pumps—**  
 Cistern, Best Makers 50¢ 10¢ 60¢  
 Pitcher Spout, Best Makers 60¢ 10¢ 60¢  
 Pitcher Spout, Cheaper Goods 70¢ 50¢  
 70¢ 10¢ 50¢

**Punches—**  
 Saddlers' or Drive, good # dos 60¢ 65¢  
 Bemis & Call Co.'s Cast Steel Drive 50¢ 50¢  
 Bemis & Call Co.'s Spring Head Socket 50¢ 50¢  
 Spring, good quality # dos \$2.50 to \$3.00  
 Spring, Leach's Pat. 15¢  
 Bemis & Call Co.'s Spring and Check 40¢  
 Solid Tinner's # dos \$1.44, 55¢  
 Tinner's Hollow Punches 30¢ 25¢  
 Rice Hand Punches 15¢  
 Avery's Revolving 30¢ 10¢  
 Avery's Saw-Set and Punch. See Saw Sets.

**Rail—**  
 Sliding Door, Wrt. Brass # 8 1/2 15¢  
 Sliding Door, Bronzed Wrt. Iron # ft. 7¢  
 Sliding Door, Iron, Painted # foot 4¢, 40¢  
 Barn Door, Light. In. 4¢  
 Per 100 feet \$2.00 2.50 3.10, 10¢  
 B. D. for N. E. Hangers Small Med. Large.  
 Per 100 feet \$2.15 2.70 3.25, net  
 Terry's Wrought Iron # foot 4¢ 45¢  
 Victor Track Rail 7¢ # foot 50¢ 25¢  
 Carrier Steel Rail # foot 4¢ 45¢  
 Moore's Wrought Iron 25¢

**Rakes—**  
 Cast Steel, Association goods 65¢  
 Cast Steel, outside goods 60¢ 10¢ 70¢  
 Malleable 70¢ 70¢ 50¢  
 Gibbs Lawn Rake \$12.00, 50¢ 10¢  
 Canton Lawn Rake \$0.00, 50¢ 10¢  
 Ft. Madison Prize Bow Brace and Peerless 65¢  
 Fort Madison Steel Tooth Lawn Rake \$0.00 25¢

**Razors—**  
 J. R. Torrey Razor Co. 20¢  
 Wostenholme and Butcher, \$10.00 to 2 10¢  
**Razor Straps—**  
 Genuine Emerson 60¢ 60¢ 50¢  
 Imitation # dos \$2.00, 30¢ 10¢ 50¢  
 Torrey's 30¢  
 Badger's Belt and Com. # dos \$2.00  
 Lamont Combination # dos \$4.00

**Rivets and Bars—**  
 Copper 50¢  
 Iron, list Nov. 17, '87 50¢  
**Rivet Sets—** 50¢ 10¢

**Reeds—**  
 Stair, Brass 25¢ 25¢  
 Stair, Black Walnut # dos 40¢

**Rollers—**  
 Barn Door, Sargent's list 60¢ 10¢ 10¢  
 Acme Moore's Anti-Friction 55¢  
 Union Barn Door Roller 70¢

**Rope—**  
 Manufacturers' prices for large lots:  
 Manila 1/4 in. and larger # 15¢ 10¢  
 Manila 1/4 in. # 15¢ 10¢  
 Manila 5/16 in. # 15¢ 10¢  
 Manila Tarred Rope # 15¢ 10¢  
 Sisal 1/4 in. and larger # 15¢ 10¢  
 Sisal 1/4 in. # 15¢ 10¢  
 Sisal 5/16 in. # 15¢ 10¢  
 Sisal, Hay Rope # 15¢ 10¢  
 Sisal, Tarred Rope # 15¢ 10¢  
 Sisal, Medium Lath Yarn # 15¢ 10¢  
 Jute Rope # 15¢ 10¢ net

**Rules—**  
 Boxwood 80¢ 10¢ 80¢ 10¢ 10¢  
 Ivory 50¢ 50¢ 10¢  
 Starrett's Rules and Straight Edges, Steel 25¢ 10¢

**Sad Irons—**  
 From 4 to 10, at factory # 100 lb

**Self-Heating—** # dos \$2.40 to \$2.55  
 Self-Heating Pail # dos \$9.00 net  
 Gleason's Shield and Toilet 25¢  
 Mrs. Post's Irons 40¢ 40¢ 10¢  
 Enterprise Star Irons 40¢  
 Combined Fluter and Sad Iron # dos \$15.00, 15¢  
 For Reversible, Self-Fluter # dos \$24.00  
 Chinese Laundry (N.E. Butt Co.) 8 1/2¢, 15¢  
 New England 10¢, 15¢  
 Mahony's Troy Pot. Irons 25¢  
 Sensible 30¢ 30¢ 50¢  
 National Self-Heating 30¢

**Sand and Emery Paper and Cloth—**

List April 19, 1886 40¢ 10¢ 50¢  
 Sibley's Emery and Crocus Cloth 30¢

**Sash Cord—**  
 Common # 10¢ 11¢  
 Patent, good quality # 13¢ 13¢  
 White Cotton Braided, fair # 28¢ 28¢  
 Common Russia Sash # 18¢ 18¢  
 Patent # 15¢  
 Cable Laid Italian Sash # 22¢ 22¢  
 India Cable Laid # 15¢

**Silver Lake—**  
 A Quality, White, 50¢ 10¢ 10¢ 50¢  
 A Quality, Drab, 55¢ 10¢ 10¢ 50¢  
 B Quality, White, 50¢ 10¢ 10¢ 50¢  
 B Quality, Drab, 55¢ 10¢ 10¢ 50¢  
 C Quality, White (only) 25¢ 40¢ 25¢  
 Sylvan Spring, Extra Braided, White, 34¢  
 Sylvan Spring, Extra Braided, Drab, 38¢  
 Sempier, Braided, White, 30¢  
 Egyptian, India Hemp, Braided, 35¢

**Sash Locks—**  
 Clark's, No. 1, \$10; No. 2, \$8 # gr. 33¢ 45¢  
 Ferguson's 33¢ 45¢  
 Morris and Triumph, list Aug. 16, 1886 60¢ 25¢

**Victor 60¢ 10¢ 50¢**  
 Walk 10¢  
 Attwell Mfg. Co. 35¢ 35¢  
 Reading 55¢ 10¢ 55¢ 10¢ 10¢  
 Hammond's Window Springs 40¢  
 Common Sense, Jap'd, Cop'd and Br'd # gr \$4.00  
 Common Sense, Nickel Plated # gr \$10.00

**Universal 30¢**  
 Kempshall's Gravity 60¢  
 Kempshall's Model 60¢ 60¢ 10¢  
 Corbin's Daisy, list Feb. 15, 1886 70¢  
 Payson's Perfect 60¢ 60¢ 10¢  
 Huginin's Sash Balances 35¢ 50¢  
 Huginin's New Sash Locks 35¢ 50¢  
 Stoddard "Practical" 60¢ 60¢ 10¢  
 Ives' Patent 60¢ 60¢ 10¢  
 Leech's, Nos. 100 and 110, # gr \$8 105, \$10.00 30¢ 10¢  
 Davis, Bronze, Barnes Mfg. Co. 50¢  
 Champion Safety, list March 1, 1886 55¢ 55¢ 50¢  
 Security 55¢ 55¢ 50¢  
 Buckeye # gr \$4.80

**Sash Weights—**  
 Solid Eyes # ton \$22.00

**Sausage Stuffers or Fillers—**  
 Milas "Challenge" # dos \$20, 50¢ 50¢ 50¢  
 Perry # dos No. 1, \$15.00; No. 2, \$21.00 60¢ 60¢ 50¢  
 Draw Cut No. 4, each \$30.00 60¢ 60¢ 50¢  
 Enterprise Mfg. Co. 30¢ 10¢ 30¢  
 Silver's 40¢ 10¢

**Saws—**  
 Diastion's Circular 45¢ 45¢ 50¢ Extras sometimes given by jobbers.  
 Diastion's Cross 45¢ 45¢ 50¢  
 Diastion's Hand 25¢ 25¢ 50¢  
 Atkins' Circular Shingle and Heading 50¢ 10¢

Atkins' Silver Steel Diamond X Cuts # foot 70¢  
 Atkins' Special Steel Dexter X Cuts # foot 50¢  
 Atkins' Special Steel Diamond X Cuts # foot 30¢  
 Atkins' Champion and Electric Tooth X Cuts # foot 27¢ 25¢  
 Atkins' Hollow Back X Cuts # foot 18¢  
 Atkins' Mulay, Mill and Drag 40¢  
 W. M. & C. Hand 30¢ 30¢ 10¢  
 W. M. & C. Champion X Cuts Regu- lar # foot 24¢ 25¢  
 W. M. & C. X Cuts, Thin Back # foot 27¢ 25¢

Peace Circular and Mill 45¢ 10¢  
 Peace Hand Panel and Rip 50¢ 10¢ 50¢ 10¢ 10¢  
 Peace Cross Cuts, Standard # foot 25¢  
 Peace Cross Cuts, Thin Back # foot 27¢ 25¢

Richardson's Circular and Mill 45¢ 45¢ 10¢  
 Richardson's X Cuts, No. 1, 35¢; No. 2, 37¢; No. 3, 24¢

**Hack Saws—**  
 Griffin's, complete 40¢ 10¢ 50¢  
 Griffin's Hack Saw, Blades 40¢ 10¢ 50¢  
 Star Hack Saws and Blades 25¢  
 Diamond Hack Saws and Blades 25¢  
 Eureka and Crescent 25¢

**Saw Frames—**  
 White Vermont # gro \$0.00 to \$0.10  
 Red, Polished and Varnished # dos \$1.50, 25¢

**Saw Sets—**  
 Stillman's Genuine # dos \$5.00 to \$7.75, 40¢ 50¢  
 Stillman's Imita # dos \$2.25 to \$2.50, 40¢ 50¢ 40¢ 10¢  
 Common Lever # dos \$2.00, 40¢ 50¢  
 Morrill's No. 1, \$15.00; Nos. 3 & 4, \$24.00, 40¢ 10¢ 60¢  
 Leach's No. 0, \$3.00; No. 1, \$15, 15¢ 30¢  
 Nash's 30¢ 10¢ 30¢ 10¢ 10¢  
 Hammer, Hotchkiss \$5.50, 10¢  
 Hammer, Bemis & Call Co.'s new Pat. 30¢ 50¢

Bemis & Call Co.'s Lever and Spring Hammer 30¢ 50¢  
 Bemis & Call Co.'s Plate 10¢  
 Bemis & Call Co.'s Cross Cut 15¢  
 Aiken's Genuine \$12.00, 50¢ 10¢  
 Aiken's Imitation \$7.00, 55¢ 25¢  
 Hart's Pat. Lever 30¢  
 Diastion's Star, \$0, No. 15, \$5.50; No. 2, 10¢ 20¢ 10¢ 10¢  
 Atkin's Lever # dos No. 1, \$6.00; No. 2, \$2.50  
 Atkin's Criterion # dos \$2.50  
 Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00 40¢ 10¢  
 Avery's Saw Set and Punch 40¢  
 Am. Tool Co.'s Superior # dos \$15, 50¢

**Saw Tools—**  
 Atkin's Perfection, \$15.00; Excelsior, \$6.00 # dos

**Scales**  
 Hatch, Counter, No. 171, good quality, # dos \$21.00  
 Hatch, Tea, No. 161 # dos \$5.75 to \$7.00  
 Union Platform, Plain \$2.10 to \$3.30  
 Union Platform, Striped \$2.30 to \$3.30  
 Chatillon's Grocers' Trip Scales 40¢  
 Chatillon's Eureka 35¢  
 Chatillon's Favorite 40¢  
 Family Turnbills 30¢ 30¢ 10¢  
 Reliable Bros. Platform 40¢

**Scale Beams—**  
 Scale Beams, list Jan. 12, '82 50¢ 10¢  
 Chatillon's No. 1 50¢ 10¢ 50¢  
 Chatillon's No. 2 50¢

**Scrapers—**  
 Adjustable Box Scraper (S. R. & L. Co.) \$4.50 30¢ 10¢  
 Box, 1 Handle # dos \$4.00, 10¢  
 Box, 2 Handle # dos \$6.00, 10¢  
 Defiance Box and Ship 30¢ 10¢  
 Foot 50¢ 10¢ 60¢  
 Ship, Common # dos \$3.50 net  
 Ship, R. I. Tool Co. 10¢

**Screen Window and Door Frames—**

Porter's Pat. Window and Door Frame 33¢ 45¢  
 Warner's Screen Corner Irons 33¢ 45¢  
 Stearns' Frames and Corners 25¢ 25¢ 10¢

**Screw Drivers—**  
 Douglas Mfg. Co. 30¢ 10¢ 10¢  
 Diastion's 45¢ 10¢  
 Diastion's Pat. Excelsior 45¢ 10¢  
 Buck Bros 30¢  
 Stanley R. & L. Co.'s Varnished Handles 65¢ 10¢  
 Black Handles 60¢ 10¢

Sargent & Co.'s No. 1 Forged Blade 60¢ 10¢ 10¢  
 Nos. 20, 30 and 60 60¢ 40¢ 10¢  
 Knapp & Cowles' No. 1 60¢ 20¢ 70¢  
 No. 1 Extra 60¢ 60¢ 10¢  
 Nos. 00 & 4 50¢ 50¢ 10¢  
 Stearns' 25¢ 10¢ 50¢  
 Gay & Parsons 35¢  
 Champion 35¢ 10¢  
 Clark's Pat. 30¢ 35¢ 45¢  
 Crawford's Adjustable 30¢  
 Ellrich's Socket and Ratchet 25¢ 25¢ 10¢  
 Allard's Spiral, new list 35¢  
 Kolb's Common Sense # dos \$6.00, 35¢ 10¢  
 Syracuse Screw-Drive Bits 30¢ 30¢ 50¢  
 Screw Driver Bits # dos 50¢ 75¢  
 Screw-Drive Bit, Parr's # gr \$0.35  
 Fray's Hol. Hdl. Sets, No. 3, \$12.00, 20¢ 25¢ 10¢  
 P. D. & Co.'s all Steel 50¢

**Screws—**  
 Wood Screws—list March 1, 1889  
 Flat Head Iron 50¢  
 Round Head Iron 40¢  
 Flat Head Brass 45¢  
 Round Head Brass 45¢  
 Flat Head Bronze 45¢  
 Round He Bronze 35¢



# THE IRON AGE

THURSDAY, MAY 2, 1889

## The Apprentice System in Germany.

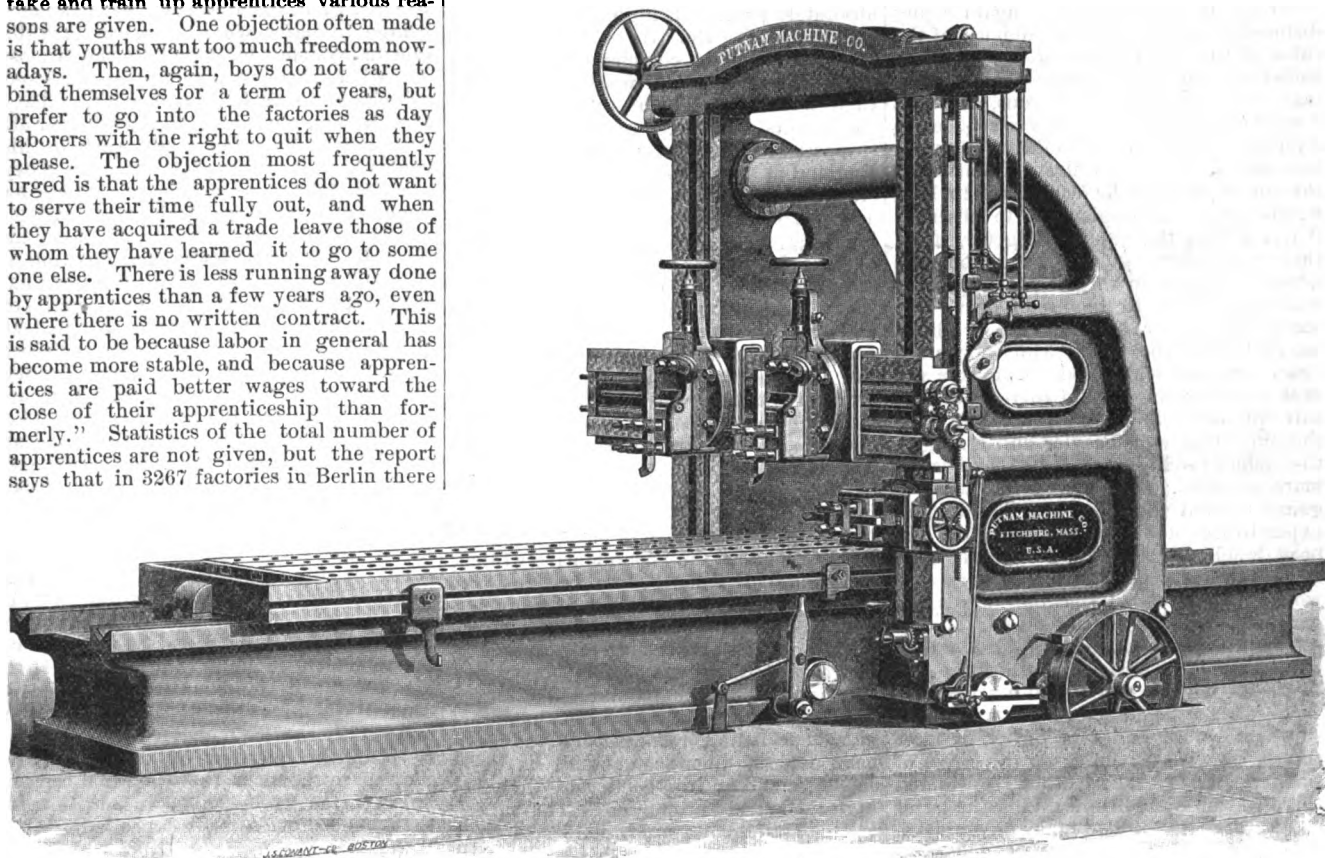
An official report from Germany on the apprentice system shows that the United States is not the only country which is troubled to know what to do with its boys. There, as here, boys prefer the liberty and comparatively good wages of an unskilled laborer to the self-sacrifice necessary to become skilled artisans. A report received by the Department of State from Commercial Agent Smith, of Mayence, on "Factory Operatives and Apprentices in Germany," says: "There is but slight disposition among manufacturers to provide themselves with skilled laborers by training up apprentices. For this disinclination on the part of manufacturers to take and train up apprentices various reasons are given. One objection often made is that youths want too much freedom nowadays. Then, again, boys do not care to bind themselves for a term of years, but prefer to go into the factories as day laborers with the right to quit when they please. The objection most frequently urged is that the apprentices do not want to serve their time fully out, and when they have acquired a trade leave those of whom they have learned it to go to some one else. There is less running away done by apprentices than a few years ago, even where there is no written contract. This is said to be because labor in general has become more stable, and because apprentices are paid better wages toward the close of their apprenticeship than formerly." Statistics of the total number of apprentices are not given, but the report says that in 3267 factories in Berlin there

had become a solid mass that was removed with difficulty. The other shoes upon the truck were in the same condition. An inspection of these shoes and tires might cause those who are using steel shoes upon steel tires to reflect deeply upon the wisdom of their course.

## Planing Machine, with Quick Return.

This planer is made by the Putnam Machine Company, of Fitchburg, Mass., whose New York office is at 115 Liberty street. The operating mechanism is conveniently arranged, and controls the advancing and receding movements of the table from

side heads on the posts, if desired. When two heads are used, as shown in the engraving, the cross-beam is extended so that one head can be run entirely out of the way, and the other permitted to have the full working range of the machine. Each head slide has a traverse of 12 inches, and has hand and power independent horizontal, vertical and angular feeds. The post heads are independent, and are operated the entire length of the post by power in either direction, besides having a quick hand adjustment. The beam, saddle, head and posts are scraped to surface plates when being fitted. The screws, rods and shafts are of steel, and the elevating screws have hardened joints and



PLANING MACHINE, WITH QUICK RETURN.—BUILT BY THE PUTNAM MACHINE COMPANY.

are 4970 apprentices. This is 66 apprentices to every 1000 workmen; too small a number, the inspector of the district thinks, to supply the bosses, foremen and skilled workmen needed. The general report of the inspectors is that the apprentices are not employed in too great proportion to adult workmen, except in some particular branches of industry and by small establishments, where a good deal of hand labor is used. Complaints, however, of the employment of too large a number of apprentices are noted from various districts.

That the use of steel brake shoes upon steel tires does not produce good results has been demonstrated by the experience of many who have given them a trial. The editor of the *Railway Review* states that he recently saw an irregular lump of steel formed by the cuttings occasioned by the use of steel shoes. These cuttings from the tire had lodged in the recess of the shoe, which was of the Ross type, and

either side of the machine, which has hand and automatic horizontal, vertical and angular feeds, universal feed in the head and extra-coarse surfacing feed. The motive parts consist of large, triple-powered steel shafts, with strong and accurately-cut gears. The rack-pinion is made from a solid steel forged blank. The pulley-pinion is made of rawhide, which, together with a well-proportioned and carefully-built train of gearing, imparts a smooth and lasting motion to the table, which reverses without shock or jar. The beam has a vertical range of 61½ inches, and can be fed (under cut) up or down the entire distance, besides having an automatic quick motion for adjustment to position. The belts are operated by an improved automatic shifter, which acts upon the loose pulley in advance of the other, thereby preventing the excessive wear of the belts and producing little or no noise in reversing.

The machine may be provided with two heads upon the cross-beam, and also with

adjustable steel steps to preserve the original accuracy of the beam. The table is heavy, well ribbed and has pockets at each end. The bed is massive and thoroughly braced, has oil pockets at each end of the ways; also cone disk oil reservoirs, which automatically lubricate the table. Between the housings the bed is made double on each side and arched over, making it extremely stiff at the point of greatest strain. The machine is made in 10, 12, 14, 16, 18, 20, 22 and 24 feet lengths of table.

The Reading Railroad Company are making heavy additions to their freight equipment, particularly for use of the coal and iron department. The Iron Car Company, of New York, are building 640 freight cars and 888 coal cars of the drop-bottom pattern. The Harrisburg Car Company are building 1821 cars, and the refrigerator car equipment is to be increased by 50 cars of the Weeks patent.

### Armor for Ships.

At the twenty-first ordinary meeting of the session of the Institution of Civil Engineers, held on Tuesday, April 9, Sir George B. Bruce, the president, being in the chair, the paper read was on "Armor for Ships," by Sir Nathaniel Barnaby, K.C.B. The author described and illustrated by drawings the applications of armor to ships in the French Navy between 1858 and 1888. He directed attention to the increasing thickness of armor to meet the growth in the gun, to the corresponding reduction in the area of surface covered, and to the eventual disuse of side armor for protecting the batteries. Thereupon the development of quick-firing shell guns was rapidly extended, and high explosives, such as gun-cotton, melinite, bel-lite, lyddite, &c., were introduced, and were being perfected as bursting charges for shells. On the assumption that thin armor was and would remain effective against such projectiles, armor of 4 and 5 inches in thickness was again being demanded by sailors for the defense of the sides of the ship in front of the batteries. Believing that such armor would be costly, ineffective and even dangerous, and that it would tend more than ever to reduce the number of ships which could be brought into action, the author drew attention at the outset to what he conceived to be a wrong policy for England. He observed it was certain that, apart altogether from these quick-firing guns, it would only be necessary to put up targets of thin armor and expose them to the fire of heavy projectiles in order to show the frightful wreck behind the target which occurred years ago, and which led to thicker and ever thicker armor. But there would be this difference in favor of the gun, that the projectiles were heavier and stronger, the velocities higher and the explosives more powerful. He showed that without going beyond the ships now building an expenditure of \$5,000,000 per ship had been reached. On examining all such large ships, whether British or foreign, it would be discovered that they were most seriously exposed to the attack of the powerful weapons now in rapid course of development. The naval authorities had to decide whether they would concur in still further enlargement in individual ships or would endeavor rather to meet these weapons by combining the forces of smaller ships. The author considered there was no difficulty in taking the latter course, and that it had many advantages. The principle of subdivision was consistent with perfect seaworthiness, with speed as high as that of the largest ships, with the control of weapons which could be used with fatal effect upon the most powerful ships of the enemy, and with such powers of endurance as would enable the smaller vessels to receive injuries from the largest ships without necessarily fatal results. If it should be said that this dispersion of force entailed a risk of destruction in detail, by encounters with units of greater force in the hands of an enemy, that argument simply went to show that organizing skill would be required to insure the presence of the united forces where they were needed.

Referring to the concentration of material value in a few ships, thus preventing the construction of many ships, he remarked that in the line-of-battle ship of 50 years ago the value of the material for a single command was about \$500,000, and the value per man in the crews of such ships not more than \$750. In the iron-clad of 12,000 tons to-day the value of ten of the former line-of-battle ships was intrusted to each captain, and not less than \$10,000 to each man in the crew. In order to put forward, in a concrete form, his view as to the type of fighting ship most

suitable for the present needs of the British Navy, he had brought forward a design. It was for a ship of 3200 tons displacement, costing one-fourth of the so-called first-class battle-ship of to-day. A sufficient number of ships of this type could probably be built and armed in two years. It might be said that nothing could be done upon such dimensions and at such cost to entitle the ship to be called a battle-ship. But the 74-gun line-of-battle ship of 50 years ago had only a total displacement of 3000 tons, and the 80-gun ship of the same period 3500 tons. This design came between the two, and would only cost as much as three 74-gun ships. If the British Government determined to spend money upon invulnerable ships, the difficulty of getting enough ships would be perpetually growing. There was no obstacle, except in finding the money, to making an invulnerable ship. Ships could be built and navigated which no torpedo or ram or gun that could be worked from any ship now in existence could fatally wound. In such a ship every man might be absolutely protected, high explosives notwithstanding. But there would be so few of them that commerce and the colonies might be lost for want of ships, and there would only be the satisfaction that the sailors had been protected in such ships as existed. The question was, Ought England at the present moment to move still further onward in increasing the size and cost of heavily-armored ships requiring four or five years to complete? Or ought this country rather to endeavor to increase rapidly the number of protected ships, capable, by reason of their speed and armament, of taking part in any engagement with an enemy, however powerful? In this exposition of the uses of armor it was apparent that fighting ships must continue to use it. When armor was employed in the form of a comparatively thin horizontal plating experiment seemed to have shown that steel low in carbon was the best material. When it was employed in the form of a wall, either upright or inclined, and comparatively thick, the value of a hard face became very marked. The various modes of manufacturing thick armor for upright, or nearly upright, defenses were described, and illustrations were given of the comparative resisting power of compound and of forged steel plates; also of two armor-plates of great excellence, manufactured at Sheffield, one of them compound, having a steel face and an iron back, and the other of forged steel throughout. The superiority of the compound plate was very marked.

The author also drew attention to the improvement effected by the use of the hydraulic press in the manufacture of thick armor-plates. To many minds it seemed that the hope of the future for peaceful sea traders lay rather in abasing than in increasing the individual superiority of the special ship of war. No efforts should be spared to raise the character and strength of the fast mercantile ships. But it must be admitted that there was no prospect of a diminution in the use of armor in regular fighting ships. The evident tendency was toward its introduction into every fighting ship. Referring to the aspect of the question from the side of the attack, the author remarked that when the large unarmored structures in the French ships were considered, the seriousness of the new attack became evident. And it was the artillerist who must be first impressed. It was of more consequence to be able to inflict damage in action than to be able to avoid it. The best defence was to be found in a vigorous attack. It must be understood that the powerful ships in modern navies were not protected, so far as their batteries were concerned, by the armor which the French thought necessary. They were unarmored from their lower

decks upward. The author asked: Was full advantage to be taken in the British Navy of these high explosives in any war which might break out within the next two or three years? Writing before the Government proposals had become known to him, he would agree cheerfully to any suggestions by the Government as to the size of the new ships and as to the use of armor for them if they were laid for approval before some competent technical committee for a month.

### The Work at Panama.

The principal engineering difficulty encountered in excavating for the Panama Canal is well described by H. B. Slaven, president of the American Dredging Company, who built successfully 15 miles of canal on the Colon side, covered by their contract. He says: "The Culebra cut is the sticking point. Into it the company have poured money like water. There are no finer engineers in the world than the French, give them a road to make or a bridge to build where they can have the bureau system developed to the utmost and where there are about seven chiefs and sub-chiefs to each man at work. They require, too, a machine shop next door all the time. But they can't work in this country, or at least on the Isthmus. They are stifled by their red tape. Where an American cannot go straight he will go round or climb over or crawl under an obstacle. The Frenchman must go through it, and that according to the original plans as signed by the chief engineer and 14 subordinates. Now, the highest point of the Culebra cut is over 300 feet above the sea. If you stuck Trinity Church steeple in it you would have to look down about 100 feet to see it. The French engineers calculated the slope at which they thought the sides of the cut ought to stand firm, and they reckoned that 10,000,000 c.m. of earth would have to be taken out. Unfortunately for them the earth refused to stand at the angle they said it would. In other words, they did not allow enough slope for the sides of the great cut. In point of fact there were 20,000,000 c.m. of earth to take out in order to make that cut stand and run a tide-level canal through. This, of course, could be done if there were money enough put up. It is all a question of money." Mr. Sloven's estimate is that the canal can be finished for \$200,000,000 in addition to the \$250,000,000 already expended.

The Philadelphia (Westinghouse) National Gas Company, of Pittsburgh, have for some time been putting gas meters into workshops and mills where the consumption of fuel has not exceeded the measuring capacity of the largest meters. Heretofore it has been practically optional with manufacturers, but recently the Philadelphia Company determined upon compulsion. This action was taken to prevent the wasting of gas, which has been going on since its introduction into Pittsburgh. Within a short time it is expected that the company will have a meter of sufficient size to measure the consumption of gas at the largest mills in Pittsburgh.

A vein of copper ore, 10 to 12 feet in width, has been discovered in Duluth while excavating for the Masonic Temple, and will probably be worked just outside the city limits.

A dozen cotton-seed oil mills, to cost \$1,000,000 or more, are in course of erection throughout the South, and to a certain extent are in competition with the Northern hog.



**Speed Regulator.**

The accompanying engravings, for which and the description we are indebted to *Industries*, represent a speed regulator which is being placed on the market by James Williams, of Manchester, England: "The novel part of the apparatus consists of a two-armed lever, with a central boss bored to fit the governor rocking shaft A, upon which it is fastened. At the end of each arm is a cylindrical vessel, into which

Such is a brief description of this apparatus, and a few words may now be said about the principle of its action. Suppose, for instance, that, as shown in Fig. 2, the governor balls are low, the mercury has run from the right to the left hand vessel and is consequently exercising a torsional strain on the rocking shaft in that direction. If, however, the sleeve of the governor is raised by reason of the increase of speed, the rocking shaft will be rotated by means of the fork, and the

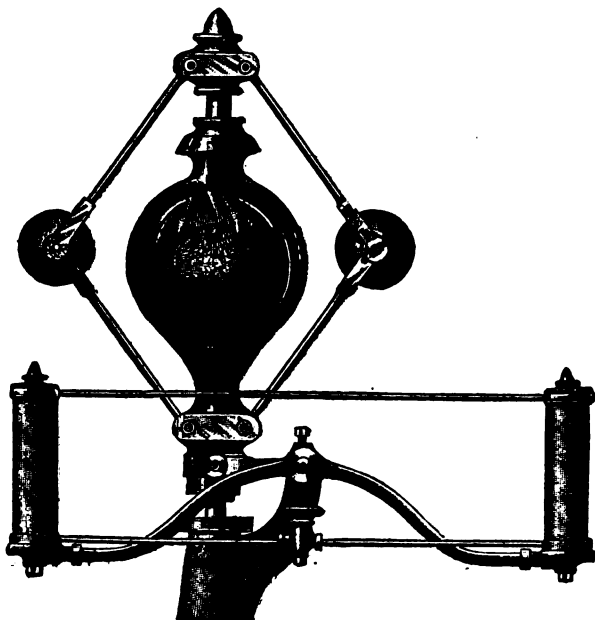


Fig. 1.

HIGGINSON'S SPEED REGULATOR.

a definite weight of mercury is introduced. These vessels are connected at the lower ends by means of a small tube, in the center of which is a tap, and at their upper ends by another tube. The latter enables the vessels to be made air-tight, and constitutes a means by which an air communication is made between them. It will be

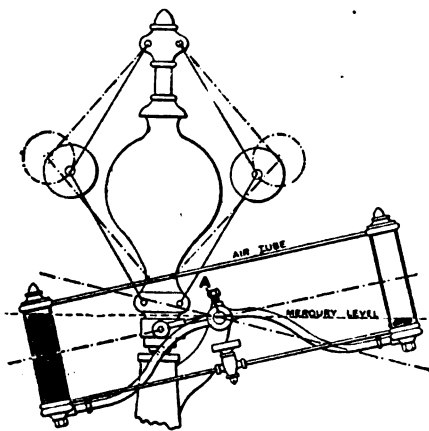


Fig. 2.

obvious that so long as the two vessels are in the same horizontal plane the level of the mercury in each will be alike; while if one is raised above the other, as shown in Fig. 2, the mercury will flow along the lower tube into the depressed vessel until the surfaces are again level, and by adjusting the tap shown the speed of this flow can be regulated. At the same time that the mercury is leaving the one vessel and passing into the other, the air contained above it can also pass by the upper tube, and the balance is thus maintained."

position of the two vessels would be reversed. In this case the shaft would be helped to make a movement in a new direction, which is equivalent to the removal of a certain weight from the governor. The provision of the small tap in the mercury tube prevents this removal or accretion of weight taking place too rapidly, and so avoids anything like hunting of the engine. It may occur that in order to preserve the isochronism of the governor it is necessary to add a greater weight when it is at its lowest position than is removed when it is assuming the higher. It that case taper filling pieces of iron are introduced into the vessels, and made of such a size and so fitted that at all positions of the vessels the required weight is added. It will be understood that the amount of mercury used will vary with the construction and size of the governor dealt with. The apparatus is quite self-contained, and only requires fixing on the rocking shaft to be ready for action. The regulator is simple, of small first cost and should be practically undamageable. Electrical engineers especially may find in this regulator a ready means of correcting the speed of the engines used by them, while it does not involve any supplementary driving or excessive complication.

As the result of the work done by the Michigan Stove Company, of Detroit, in testing and applying aluminium additions to iron in making castings, they were the recipients of many letters containing inquiries, &c. They have made arrangements with a producer of aluminium who makes about 50 pounds per day to supply the metal to purchasers at \$5 per pound. The quality of the metal has steadily improved. One of the first lots contained 95.5 per cent. aluminium, 1.62 silicon and 2.88 iron. Another lot showed by analysis

96.35 per cent. of aluminium, 2.16 per cent. of silver, 1.47 per cent. of iron and 0.02 of copper. A few days since a 50-pound lot just received carried 98.34 of aluminium, 1.34 silicon and 0.32 iron. At first considerable trouble was experienced in endeavoring to roll the metal, but now it is rolled to any thickness. The Michigan Stove Company have recently received some foil, and also a quantity rolled to No. 8 Brown & Sharp gauge. They are ready to supply it from  $\frac{1}{4}$  inch down. They attain good results down to 0.005 inch in plates 9 inches wide. The Michigan Stove Company certainly deserve credit for the energy which they have displayed in this matter. They have done more than any one to bring the properties of aluminium into public notice, and are instrumental in bringing the price down to a point where the metal can come into general use.

**Our Trade with China.**

The delay on the part of the President in the appointment of a Minister to China is said to be due to a desire of the Administration to select for the office not only a good diplomat, but a man who will be likely to exert influence in the development of trade between China and the United States. Our trade with China has not varied much in aggregate value during the last ten years, but the exports from the United States to China have been gradually increasing since 1870. In 1878 the total value of imports and exports of merchandise was \$24,987,738; in 1888 it was \$26,061,000. In seven out of these ten years, however, the total commerce exceeded the figure for the last year. This figure was also exceeded in 1872 and 1873. The exports in 1870 were valued at \$3,116,381; in 1878 they were \$6,867,255, and in 1888, \$7,926,000. The year of largest exports was 1886, when they amounted to \$11,576,817. Our exports to China during the last fiscal year were less than they have been in seven years, with the exception of 1884. Our imports from China were less than for eight years, with the exception of 1884 and 1885. Our imports from China are chiefly tea, raw silk, hides and skins, materials for hats and bonnets, furs and rice. Our exports are principally cotton cloths and illuminating oils. We sent \$5,181,050 worth of cotton goods to China alone in 1887, and in 1888 \$3,128,771 worth. For the first eight months of the present fiscal year our exports of cotton cloths, so far as shown by Government statistics, were only \$823,808, as compared with \$2,096,347 for the first eight months of 1888. This would seem to indicate that the result of the hasty action of Congress early last autumn in passing the Chinese Exclusion bill had been to diminish the demand from China for our goods. This tendency is shown also in the exports of mineral oils.

The commerce of the United States with China in 1886 (one of the greatest years) was estimated at only 8 per cent. of the entire foreign commerce of that country, while that of Great Britain was estimated at 75 per cent. The geographical position of the United States gives them commercial advantages over Great Britain and over most other countries in the securing of Chinese trade, and when the importance of the country's resources are considered, the necessity for maintaining cordial official relations between the Government of China and our own is more thoroughly appreciated. The figures given above showing the decrease in our exports thither since last June seem to make a very pointed moral to Congressional mischief-making for political ends, and ought to be sufficient warning for the future.

### Facing Machine.

We have previously illustrated several tools of a new system for finishing bolts and nuts. In our issue of September 22, 1887, we described a machine for finishing the sides of bolt-heads and nuts called a

ing it in position. A long hole through the spindle permits the placing of a bolt 20 inches in length. The bolts are held by universal chucks. For nuts the racking is used, which insures true dressing in relation to the axis, and which at the same time admits of a loose fit on the

the plunger, and the work must, of necessity, be uniform as long as the two spindles remain duplicates, as the distance traveled by the plunger at each stroke is always the same. This machine is built by Nicholson & Waterman, of Providence, R. I.

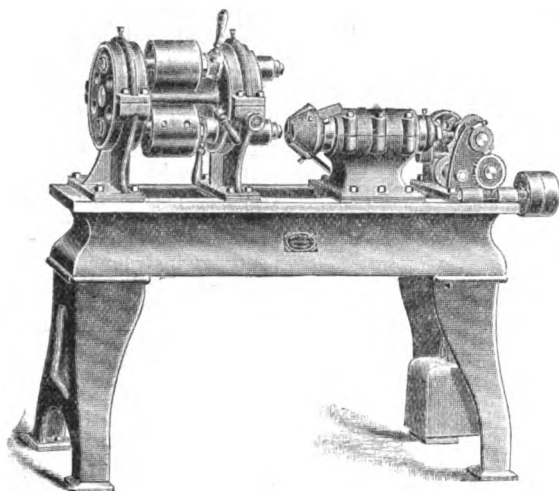


Fig. 1.

THE NICHOLSON FACING MACHINE.

broaching and milling machine. In this issue we show the perfected companion tool—one for dressing the top and bottom of nuts and the top of bolt-heads. The work done by this machine is the finishing of the tops uniformly, as a matter of taste, and the dressing of the bottom true with the axis of the thread, at the same time relieving the corners and chamfering the first thread. At one end of the table is the cutter-holder and its driving mechanism, and at the other end the spindles for carrying the nuts or bolts to be dressed. Two spindles, duplicates of each other, are

thread of the spindle, a most important item in rapidly removing and replacing nuts.

The movement of the cutter-head is governed by a cam and weight. The cam is made to advance gradually and recede

The Bookwalter or Robert process for the manufacture of steel is likely to be very thoroughly tested in the West this year. The Michigan Steel Company, of Detroit, are rapidly pushing work on their plant, which they hope to have in operation early in June. The machinery is being built by the Morgan Engineering Company, of Alliance, Ohio. The steel to be turned out by these works will be of a special quality for springs to be manufactured by the Detroit Steel and Spring Works. At Chicago the Fowler Steel Car-wheel Company have their buildings erected for the steel works, and will be prepared at an early day to put in the machinery, which they expect to start up in July. Their plant will make steel castings in the form of wheel-blanks for their rolling machine. The plans which have been prepared for these works show a remarkably compact and convenient arrangement of the several departments, which is worthy of extended description. Another steel plant on this system is projected near Chicago, but negotiations with the owners of the patents have not yet been completed. If this plant is built it will make a dead soft steel to take the place of highly refined iron in the manufacture of a specialty. A peculiar characteristic of the Robert steel, which was noted by a very practical engineer who spent some time in investigating the process at Springfield, Ohio, is the

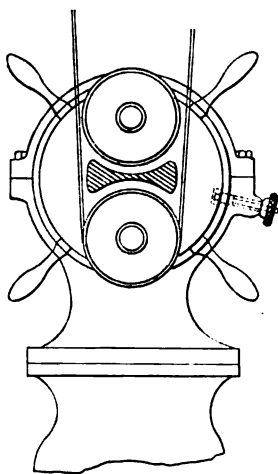


Fig. 2.—Cross Section of Spindles.

placed one above the other, and as the driving pulley on the counter-shaft is larger than those on the spindles, the upper spindle always remains stationary. This enables the operator to remove and replace the work, while at the same time a plunger carrying cutters advances, dresses the work and retires quickly. At this moment the operator reverses the spindles, bringing the dressed nut uppermost in position for replacing. The number of oscillations made by the cutter-holder represent faces dressed, and can be varied to suit the requirements from 1 to 4 per minute. The two spindles run in tapered hardened bearings provided with take-up for wear. The drum on the spool has handles for revolving it and hardened pins for lock-

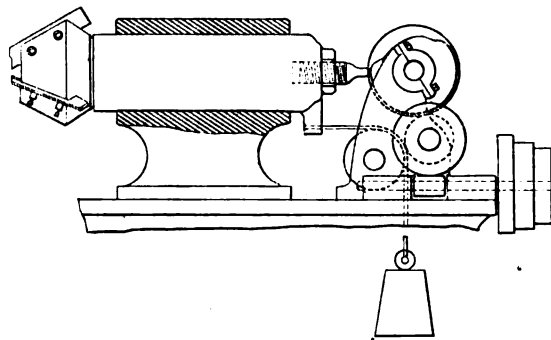


Fig. 3.—Section of Cutter-Holder.

quickly, remaining removed a sufficient time to allow the operator to reverse the spindle. The number of movements back and forth in a given time can be altered by changing the gears which connect the cam-shaft with the shaft carrying the worm gear. Power is furnished by a

difference of hardness between it and open-hearth steel. He states, for instance, that 0.15 carbon Robert steel is as hard as 0.25 carbon open-hearth steel. This is a more decided difference than that which has been found to exist between open-hearth and Bessemer steel, less carbon contents being required in the former to equal that of the latter.

A test of the edge-tools made of steel produced by the Falls City Malleable Iron and Steel Company, of Louisville, Ky., was made lately by F. R. Levering at the works of the United States Rolling Stock Company, at Anniston, Ala.

Immigration was a little heavier in 1888 than in 1887, the total number of persons entering being 525,019, against 516,933 in 1887, 392,887 in 1886 and 332,361 in 1885. This is exclusive of the overland immigration from Canada and Mexico. An analysis of the figures shows that of the immigrants 326,556 were males and 198,463 were females. Great Britain sent 173,141, of which 71,966 were from Ireland. The Germans numbered 106,975, the Swedes 48,845, the Italians 47,424, the Russians 35,504, the Austrians 25,080 and the Hungarians 12,856.

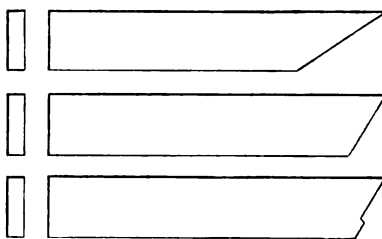


Fig. 4.—Cutting Tools.

narrow belt turning a cone on the worm shaft, which through suitable gearing drives the cam, which forces forward the plunger, carrying the cutting tools, the plunger being withdrawn by the weight arranged as shown in Fig. 3. The product of the machine is controlled by the rapidity of movement of the cam moving

**The Catasauqua Scrap-Iron Frauds.**

Ex-Burgess Philip Storm, of Catasauqua, Pa., was lately arrested on a *capias* charging him with having assisted in defrauding the Catasauqua Mfg. Company out of \$12,862.61. A *capias* has also been issued for the arrest of John W. Hopkins, the present Burgess of Catasauqua, but he cannot be found, having disappeared several weeks ago. Hopkins was assistant superintendent of the Catasauqua Mfg. Company, and weighed the scrap-iron furnished by Storm. He made false entries, and the money paid for scrap-iron in excess of what the company actually received is alleged to have been divided by Storm and Hopkins. Storm was placed under \$13,000 bail. The amount of scrap-iron paid for and not received amounted

## Leavitt Air Compressor

FOR

### the Calumet and Hecla Mines.

The air compressor of which we herewith present drawings of some of the more prominent parts was designed by E. D. Leavitt, Jr., and built by the I. P. Morris Company for the Calumet and Hecla Mining Company. It is now located at the Hecla mine. [Figs. 1, 2, 8, 16, and 17 will be found on supplementary sheet.]

The compressor has two double-acting plungers of 42 inches diameter and 60 inches stroke, and operates upon the displacement principle, the plunger working through a central packing or bearing in a

being 8 feet deep and 36 inches wide. The compressor measures over all 40 feet 6½ inches, and the cylinders are placed 14 feet between centers. Each of the two bed-plates, the forms of which are clearly outlined in the plan and side elevation of the entire compressor, Figs. 1 and 2, is a single casting weighing, finished, 38,000 pounds. The extreme measurement of the plate is 25 feet 11½ inches. Each plate is held to the foundation by nine 3-inch bolts, distributed four at the cross-head, two at the center and three at the outer end. The jaws to receive the shaft bearings are rectangular and each measures 20½ inches deep, 26 inches long and 28 inches wide. The boxes are babbitted and formed with circular dovetailed grooves to receive and hold the babbitt. The adjustment of the bearing is accomplished by means of two wedges 28 inches wide and 12½ inches in

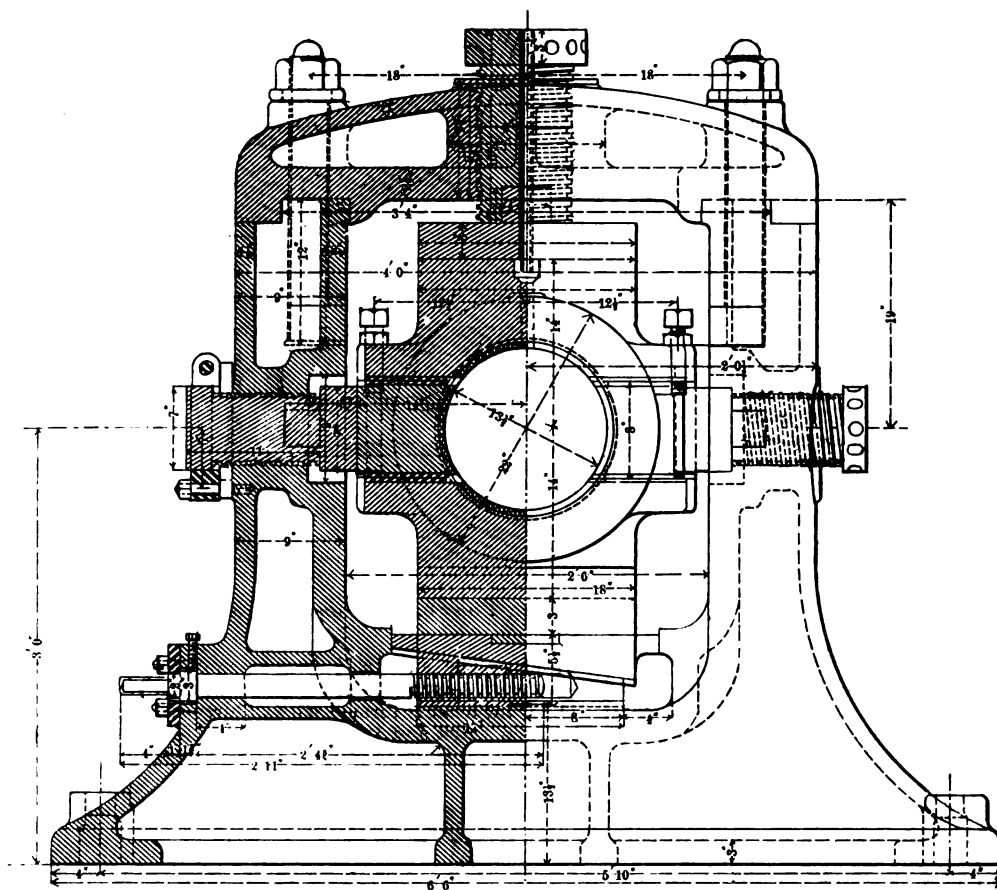


Fig. 4.—Vertical Section Adjustable Pedestal.

to 1,493,015 pounds. The fraud has been carried on since 1886.

Referring to the dispatch from Allentown, recently printed in some of the daily papers, that Oliver Williams, president of the Catasauqua Mfg. Company, had been requested to resign, we are informed by one of the directors of the company that there is not the slightest foundation for the report. Mr. Williams has been manager of the company for over 20 years, and is one of the largest stockholders. Under his management the corporation has grown to be one of the largest and most successful in the Lehigh Valley. The plant was small and insignificant when he assumed control. The company has accumulated a large reserve fund, has paid dividends regularly, and has an enviable reputation for its products. In the prosecution of the men who have defrauded the company through sales of scrap-iron, every step has been taken after consultation with the board of directors, and they are a unit in supporting Mr. Williams in the course he has adopted. He is so well known in the Eastern trade that a denial of the rumors is hardly needed by his friends.

cylinder partly filled with water. The cylinder is divided by the bearing and plunger into two compartments, each of which is partly filled with water, the quantity being such that the plunger is always entirely submerged, even when at either end of its stroke. Each movement of the plunger lowers the water in one compartment of the cylinder and raises it in the other, the water thus acting, to all intents and purposes, as an extension of the plunger. The lowering water draws in air from the atmosphere through two rows of valves encircling the dome or air receiver, and at the same time the advancing plunger forces the water in the opposite compartment upward into the valve-chest, thereby displacing the air which had been admitted during the preceding half of the stroke. Provision is made for the forcing, through many finely punctured nozzles, of water into the upper part of the valve-chest during the compression and expulsion of the air.

The foundation consists of a body of concrete upon which is built a bed of brick 13 feet 6 inches thick, 60 feet long and 33 feet 8 inches wide, the wheel-pit

being 8 feet deep and 36 inches wide. The compressor measures over all 40 feet 6½ inches, and the cylinders are placed 14 feet between centers. Each of the two bed-plates, the forms of which are clearly outlined in the plan and side elevation of the entire compressor, Figs. 1 and 2, is a single casting weighing, finished, 38,000 pounds. The extreme measurement of the plate is 25 feet 11½ inches. Each plate is held to the foundation by nine 3-inch bolts, distributed four at the cross-head, two at the center and three at the outer end. The jaws to receive the shaft bearings are rectangular and each measures 20½ inches deep, 26 inches long and 28 inches wide. The boxes are babbitted and formed with circular dovetailed grooves to receive and hold the babbitt. The adjustment of the bearing is accomplished by means of two wedges 28 inches wide and 12½ inches in

height, the true movement of each of which is obtained by two square threaded screws, one of which is united to each end of the base of the wedge, which is, of course, inverted and operated from the top of the cap. Each screw carries a steel gear, between and meshing with each of which is an intermediate gear, also of steel, the teeth being cut absolutely free from backlash. It is evident that any movement of either of the main gears will raise or lower the wedge to which the screws are united, and will do this without the possibility of bringing the wedge to an uneven bearing. The three adjustable pedestals carrying the pinion shaft are bolted to the top of the bed-plate, their center line being 14 feet 4½ inches horizontally and 4 feet 3 inches vertically from the center of the crankshaft. Their construction is shown in the drawing Fig. 4. The box consists of four parts, each of which can be adjusted independently. The top and two side parts of the bearing are moved to adjustment by means of square threaded studs, while the bottom quarter is actuated by a wedge moved by a screw and the lower surface of which is horizontal and upper surface in-

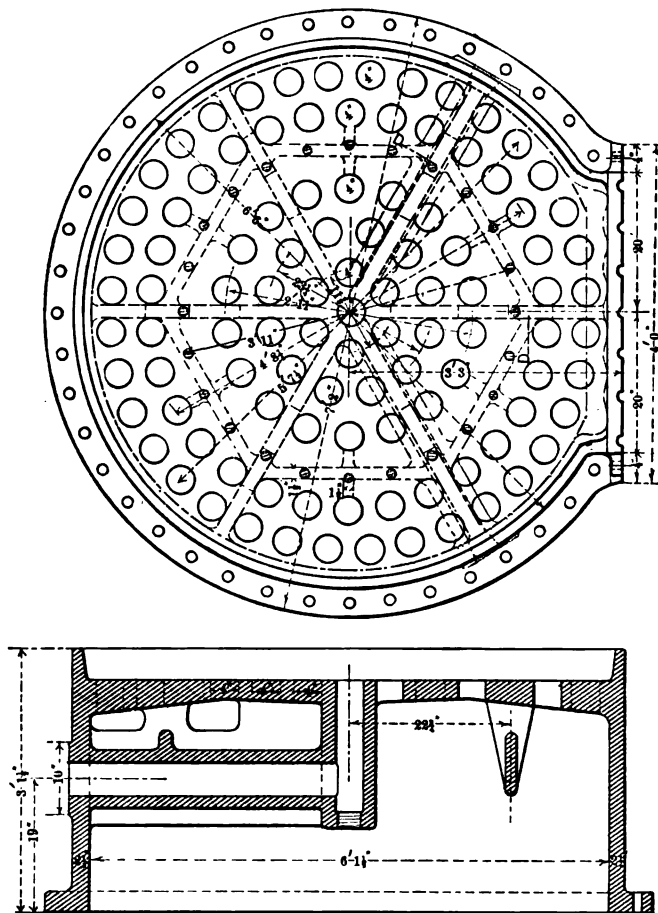
clined  $1\frac{1}{4}$  inches per foot. Horizontal and vertical angular movements are provided for by the concave chocks in which the brasses rest. Accurate aligning of the three bearings of this, which is really the driving shaft, is thus obtained.

The cranks, crank pins, shafts and connecting rods are of Krupp's oil-tempered crucible steel, having an elastic limit of 45,000 pounds per square inch and an elongation of 18 per cent. in 10 inches. Each crank is 11 inches thick, 2 feet 9 inches in diameter at the shaft and 20 inches in diameter at the pin. The crank is bored  $18\frac{1}{2}$  inches to fit the shaft to which it is keyed. The pin is forced into the crank, and is 10 inches in diameter and 10 inches bearing length. The crank-shaft is 13 feet 2 inches long,  $16\frac{1}{2}$  inches in diameter at the bearings and 19 inches in diameter at the gear. It is made hollow, the diameter of the bore being 6 inches. The length of connecting rods between centers is 15 feet, and over all 17 feet  $\frac{1}{2}$  inch. Each weighs, complete, 3860 pounds. At the cross-head the rod is 6 inches in diameter, and at the crank end  $10\frac{1}{2} \times 7$  inches. The crank-end boxes are cast steel and the cross-head boxes are brass, both babbitted. The adjustment of the box in each bearing is provided for by a wedge operated by two square threaded bolts placed in line, and one entering the wedge from each side. By means of these bolts the box, through the upward or downward movement of the wedge, can be brought to the desired bearing. The cross-head gibs are of cast iron, the bodies being Eureka steel, and their surfaces are babbitted and turned to a circle 30 inches in diameter. The bearing is  $2\frac{1}{4}$  feet long and 18 inches wide measured on the chord. The pin is ground in the two webs of the body, and on it is keyed a sleeve, 8 inches in diameter, to which the connecting rod-bearing fits. The inner end of each bed-plate is circular in section, 5 feet in diameter, and is flanged to receive bolt-holes and faced to fit the end of the cylinder.

Each cylinder is formed of a single casting faced at the top, ends and side to receive, respectively, the valve-chest, heads, and manhole plates. The casting is  $2\frac{1}{4}$  inches thick. The plunger bearing is formed in the lower part of a wall dividing

has a diameter of 6 feet. The cylinder bushing is of composition and is 28 inches long. The plunger, of which we show a longitudinal section in place in the cylinder, is 42 inches in diameter outside,  $7\frac{1}{4}$  feet long

being  $2\frac{1}{4}$  inches thick. The top is faced to receive the valve seats, the openings for which are 4 inches in diameter. The arrangement of both the inlet and outlet valves is shown in Fig. 7, which is a plan



Figs. 7 and 8.—Plan and Vertical Section of Valve Chest.

without the heads. The shell is  $\frac{1}{4}$  inch thick and is cast with 4-inch ribs at every 15 inches. The front head is formed with 12 radial ribs 1 inch thick and  $16\frac{1}{2}$  inches deep. The plunger-rod is made of forged

view of the top of the valve chest, a vertical section of which is shown in Fig. 8. Thirty-six inlet valves are placed in a circle 5 feet  $7\frac{1}{4}$  inches in diameter, and 30 inlet valves are placed in a circle 4 feet

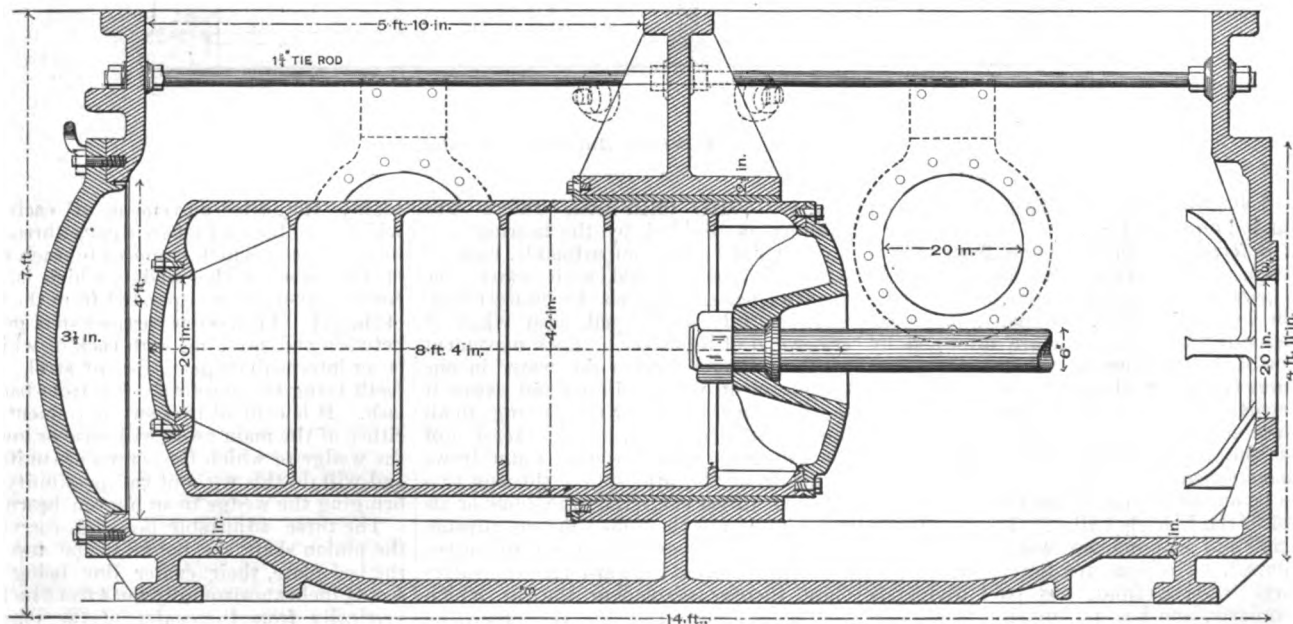


Fig. 5.—Vertical Longitudinal Section through Cylinder and Plunger.

the cylinder into two compartments. This wall is strengthened by means of ribs, as shown in the drawings of both the longitudinal and cross-section, Figs. 5 and 6.

The cylinder measures  $13\frac{1}{2}$  feet over all and

crucible steel, 6 inches in diameter and 8 feet  $8\frac{1}{2}$  inches long over all.

The valve chest for each cylinder is circular in plan, 6 feet  $1\frac{1}{4}$  inches in diameter inside and 3 feet  $1\frac{1}{4}$  inches in height, the sides

$8\frac{1}{2}$  inches in diameter, these two circles being outside the air receivers. Within each air receiver are 18 delivery valves in a circle 2 feet 11 inches in diameter, 12 in a circle  $23\frac{1}{4}$  inches in diameter and 6 in a



circle 11½ inches in diameter. Each receiver is 8 feet 8 inches in diameter, and is held to the valve seat by 1½-inch bolts passing through a flange located between

of inlet-valves. On its return the plunger displaces and thereby raises the water in the cylinder, which forces the air which had been drawn from the atmosphere up

principle as the compressor—namely, a plunger working in a circular packing in a cylinder and operating by displacement—is so arranged as to deliver water to the nozzles in that chest from which the air is passing to the air receiver, the vast number of small holes in the nozzles insuring the perfect and thorough distribution of water to all parts of the chest.

The practice of injecting water into the cylinder at each stroke in order to absorb the heat created by the compression has been discarded by some of the manufacturers of air compressors, who claim that the air, from the compressor to the machine operated, should be kept as dry and free from moisture as possible in order to prevent freezing of water at the exhaust ports. The spray injection was, therefore, condemned as the direct cause of much needless trouble. A second objection was also brought forward—a mechanical one—that the presence of water in the cylinder prevented the proper lubrication of the piston, and quick wearing of the parts resulted.

It will be observed that in the compressor we are describing a most perfect and thorough system of water injection has been provided, and that seemingly an attempt has been made to saturate the air with moisture. The plunger is completely submerged at all times. And yet this same compressor has shown no signs of un-

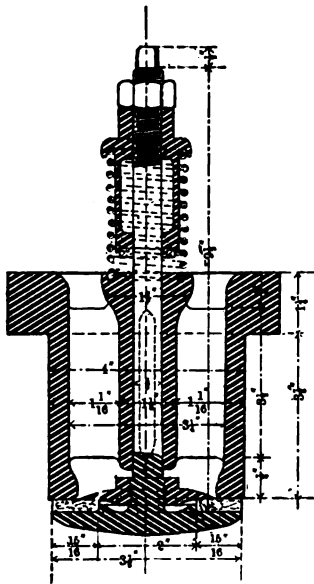


Fig. 9.—Inlet Valve.

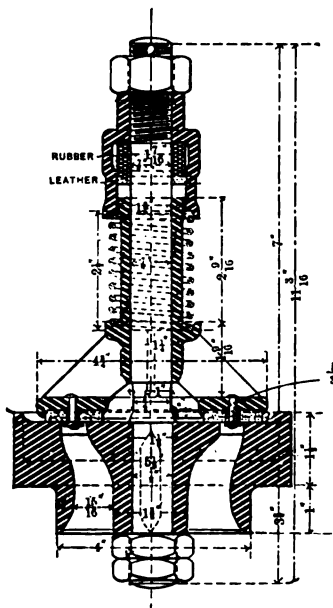
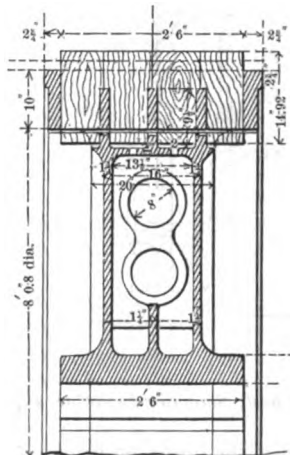


Fig. 10.—Delivery Valve.

the inlet and outlet circles of valves. Each pair of receivers is connected by a pipe, half of which is cast with each receiver, and from each pair leads a 16-inch cast-iron delivery-pipe.

The valves are shown in the drawings Figs. 9 and 10.

The injection piping in each valve chest is placed beneath the valve seats, and consists of two hexagonal rows of brass pipes, as shown in the plan Fig. 11, the inner row being of 1½-inch pipe and the outer of 2-inch. On the smaller piping are placed six rose nozzles and on the outer 12, each nozzle being drilled with 55 holes ⅛ inch in diameter. A section and development of the nozzle are shown in Fig. 13. The nozzles are supplied with water by a pump having a bore of 7 inches and a stroke of 12 inches, located one at each inner side of each cylinder, and operated by an eccentric on the crank-shaft. Provision is made for draining the air re-



Figs. 14 and 15.—Mortise Pinion.

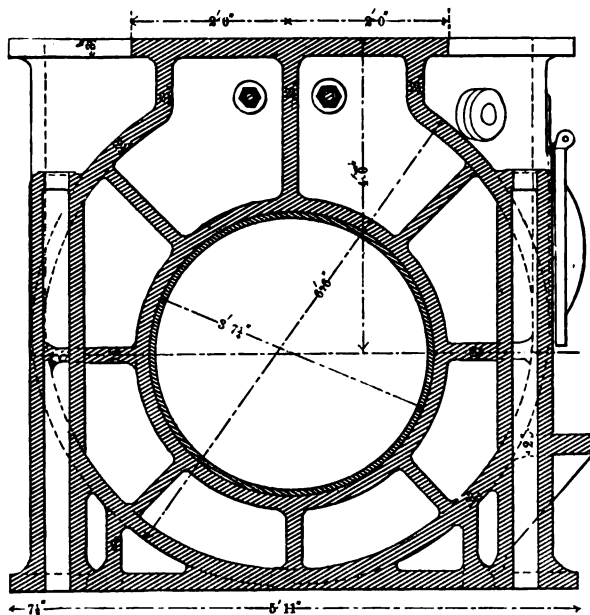
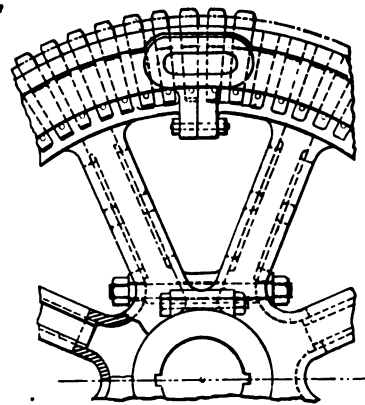


Fig. 6.—Cross Section through Center of Cylinder.

ceivers through properly arranged piping. From the foregoing the action of the compressor will be readily understood. The advancing plunger draws the air into the valve chest through the two outer rows

through the delivery-valves into the air receiver, the same action taking place, but alternately, in the other end of the cylinder. The stroke of the pump, which is constructed to operate upon the same

usual wear, and no trouble whatever has resulted from the condensation and freezing of vapor at the exhaust ports of the drills.

The compressor is driven through the pinion-shaft by the compound engine Frontenac, which also drives a duplicate compressor and a Rand compressor with cylinders 28 inches diameter by 48 inches stroke.

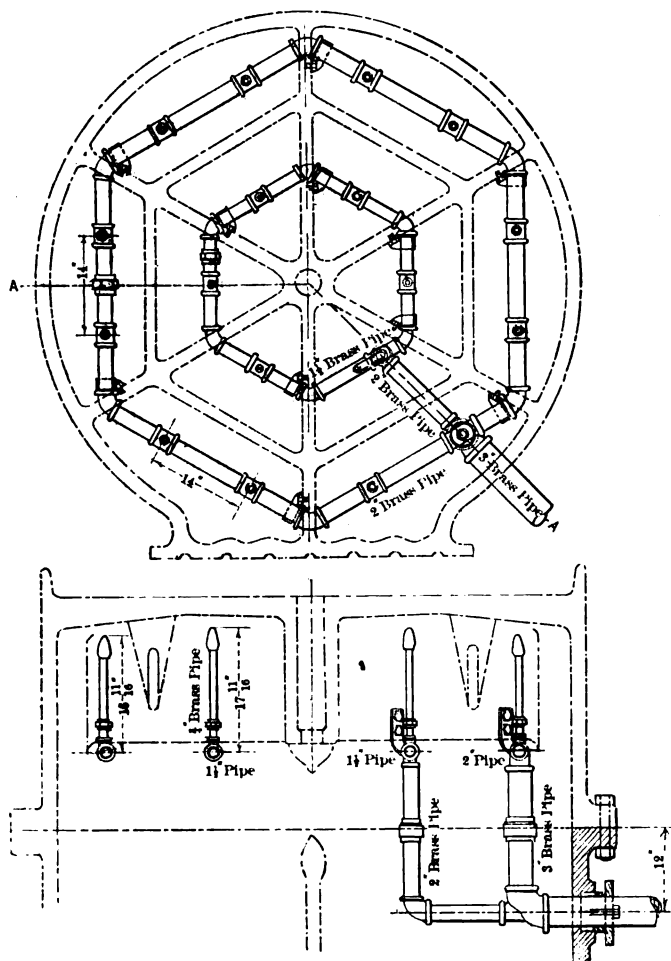
The pinion, Figs. 14 and 15, is 10 feet in pitch diameter, 30 inches face and is cast in two segments, each of four arms. The arms are rectangular in section, with rounded corners, 8 x 16 inches, the former measurement being in the plane of the wheel. The sides of the arms are 1½ inches thick, and with the plane are 2½ inches thick. The rim is cast with four rectangular grooves 12 inches deep and 6½ inches wide, each being formed by two outer and three inner flanges. The 80 teeth are of the best quality of young hickory thoroughly seasoned. The meeting surfaces of the two segments are faced and united by four 2-inch and two 2½-inch bolts at the hub, placed as shown in the drawing, and 1½-inch bolts through flanges at the rim. Over lateral lugs at the sides of the rim at the joint are shrunk wrought-iron yokes. The weight of the wheel complete is 28,000 pounds. The spur gear, Figs. 16 and 17, has a pitch diameter of 20 feet, 30 inches face, 160 cut teeth and is cast in eight segments. The outer ends of the segments

are faced, flanged and held by four 2-inch bolts. The arms are hollow,  $2\frac{1}{2}$  inches thick in the plane of the wheel and  $1\frac{1}{2}$  inches thick at the sides. Where the spoke, which is elliptical in section, joins the rim, its dimensions outside are 18 inches x  $8\frac{1}{2}$  inches, and at the hub 15 x 10

of bronze alloy, containing 10 per cent., 1 pound of which would be 10/6, and the other 9 pounds of copper at market price, say 9d per pound, and in the ferro aluminium costs 12/6 per pound, and no charge for the iron. The ferro-aluminium ranges from 10 to 18 per cent. aluminium.

and cast in the usual way, when the iron is found to have taken up 1.75 per cent. of aluminium. The castings are exceedingly sonorous, have a white fracture and are quite free from blow-holes.

We have also the Castner process at work at Oldbury, producing from 400 to 500 pounds of pure aluminium per day. This system is entirely different from those already described, and depends (1) upon the cheap manufacture of sodium, (2) on the manufacture of a double chloride of sodium and aluminium, and (3) on the manufacture of pure aluminium. The success of the Castner process lies in the fact that by a new process the cost of sodium has been reduced from 4/ to 1/ per pound, and of aluminium from 60/ to less than 20/. The aluminium is produced in pigs of 4 pounds weight; the same size of bar in bronze, containing 90 per cent. of copper and 10 per cent. of aluminium, would weigh 12 pounds. With sodium at this low cost, it is said that not only are we to have aluminium cheap, but also magnesium, silicon and boron, and we may then lookout for more new alloys. Pure cast aluminium has a density of 2.56, forged 2.67, or only one-third that of forged steel. It melts at about 1300° F., and is the best conductor of heat and electricity known, and practically is inoxidizable even at high temperatures. Aluminium silver, composed of aluminium, copper and nickel, makes excellent cutlery, will take an edge like steel, cuts the hardest wood and does not require electroplating. A new alloy, with 10 per cent. of tin and aluminium, has nearly the same density as pure aluminium, and can be used as a solder, will take a fine polish and not tarnish. It will be seen what rapid strides the manufacture of this most interesting metal is making. That there is room for all that can be made is evident from the numerous applications I have mentioned, and that the most successful should be in the shape of an alloy rather than a pure state seems strange.



Figs. 11 and 12.—Plan and Vertical Section of Valve Chest, Showing Injection Piping.

inches. The inner end of the arm is turned to form a tenon 8 inches in diameter at its inner end and 10 inches at its outer portion. This tenon fits in a bored mortise in the center. The arm widens above the tenon and is faced to accurately fit the center, to which it is held by four  $1\frac{1}{2}$ -inch bolts. It is further secured by a wrought-iron key extending transversely. The center has eight faced sides to receive the arms and is  $5\frac{1}{2}$  feet in diameter. After the hub had been forced on the crank-shaft by a pressure of 200 tons, two wrought-iron bands were shrunk on recesses turned in the outer ends of the hub.

#### Aluminium Alloys.

In an address delivered by Charles Wood, as president, before the Cleveland Institution of Engineers, the following reference is made to aluminium alloys:

Aluminium brass, in consequence of its toughness, rigidity and strength, is sure to come into use; the specific gravity being only 7.6, makes it cheap at £108 per ton. The ordinary brass will carry about 40 tons with 9 per cent. elastic limit, and is being largely used by the American Government for propellers, hydraulic work, pinions, &c. A special mixture has been tried on the London tramcar bearings with excellent results. Another interesting feature is that the bronze will stand high temperature without loss of strength. The electric furnace aluminium copper alloy is sold at 10/6 per pound of aluminium guaranteed by analysis, and the copper at market price—that is, if we take 10 pounds

As in copper, the direct addition of pure aluminium to iron and steel is a great loss; it floats on the top of the molten metal and passes off with the slag, and it will be at once seen that the ferro-aluminium pos-

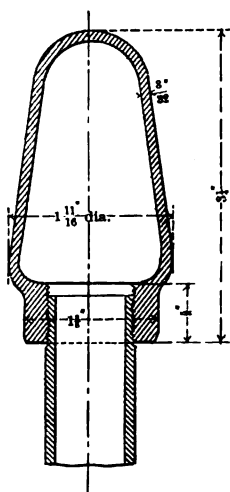
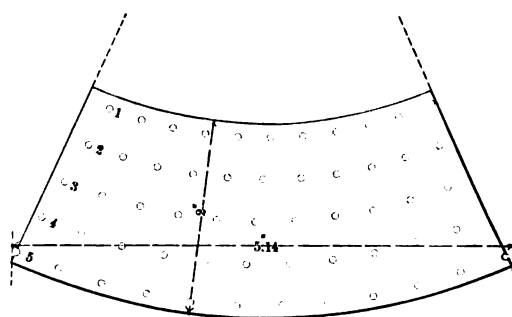


Fig. 13.—Injection Rose.

sesses a great advantage, as it amalgamates immediately without loss. A new process has within a month been brought out by Messrs. Brin Brothers, of London, who mix a rich clay with a flux into a paste, and charge this in alternate layers with thin cast-iron scrap into a cupola; the iron, when melted, is run out into a ladle

A large plate-glass deal was effected in Pittsburgh recently by the Pittsburgh Plate Glass Company, who are said to have paid \$1,500,000 for the Forest Plate Glass Works, thus securing control of the entire plate-glass business in that section, if not in the country. The company already owned two large factories, and this acquisition of the third gives them con-



Development of Rose.

trol of a combined production of 500,000 feet of plate-glass per month. The three factories are all in the Allegheny Valley, near Pittsburgh. Capt. J. B. Ford, who was the principal owner of the Forest City works, is also a heavy stockholder in the Pittsburgh company.

The present population of Chicago is 853,000. By incorporating in a single municipality the half-dozen villages in her environs, as contemplated by a bill pending in the State Legislature, she will have 1,221,000 inhabitants and rank second only to New York among American cities.

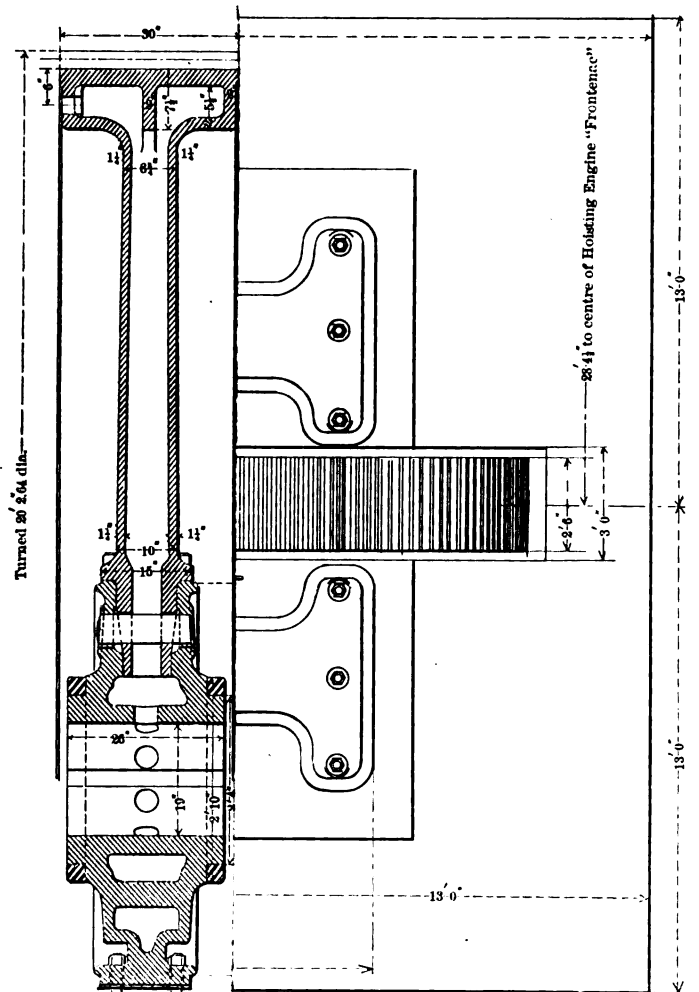
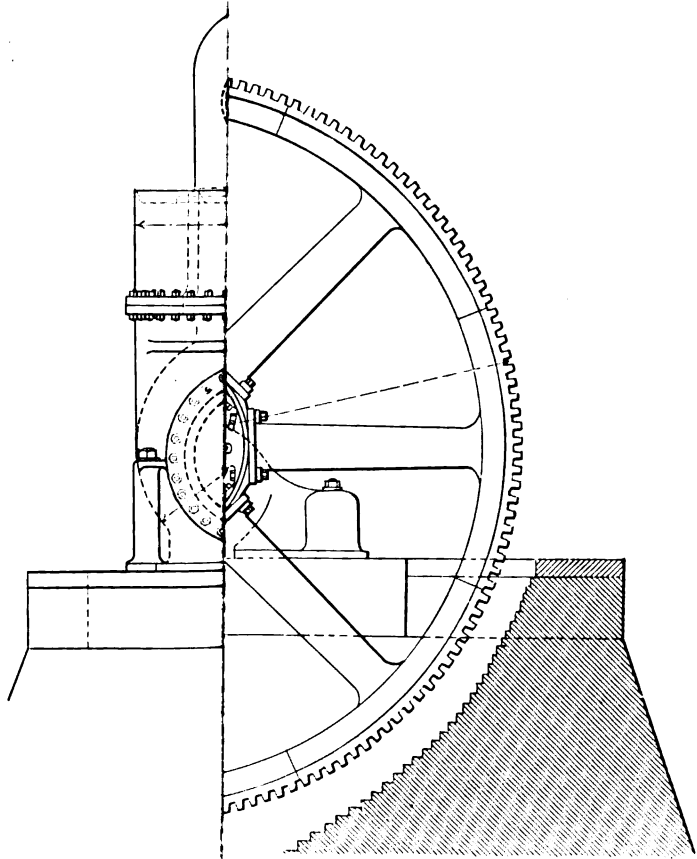


FIG. 1.—PLAN.



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## THE WEEK.

The North German Lloyds Steamship Company, one of the most successful in the Transatlantic trade, in their balance sheet for 1888 show an exceptionally strong position. The fleet comprises 140,000 tons, standing on the books at a valuation exceeding \$13,000,000. Besides they hold property worth at least \$2,000,000 and \$1,400,000 in cash and securities.

One of the Paris newspapers, whose founder is an American, urges the importance of sending out from the United States a strong representation of trained mechanics to the Paris Exposition. An idea that should be heeded.

C. P. Treat, the well-known railroad contractor, who has been with a company of engineers on the Nicaragua Canal for some time past, says an expedition will start from the United States May 10, and upon its arrival at Greytown active work will be begun. A hotel to accommodate 500 people will be shipped to Greytown by a New York company.

The Monongahela Furnace Company, who are connected with the National Tube Works Company, of McKeesport, have broken ground for the large blast furnaces which will be erected in that town. The building of the furnace will be commenced about May 1.

Charles Denby, United States Minister to China, speaking of taxation in that country, says: "The chief tax is on land; there is no tax on personality. The land tax, the salt monopoly, lekin, foreign and native customs duties, and the proceeds of sales of honors and offices make up the revenue of the State. To the absence of taxation of the people," he says, "may well be ascribed the permanence of the Government and the tranquillity and contentment of the Chinese race."

Admiral Kimberly, in his official report of the disaster at Samoa, commends Captain Kane, of the English steamer Caliope, which successfully steamed out of the harbor, for turning over to the Americans his complete diving outfit, which would prove valuable in saving guns, &c.

Laredo, Tex., is a rising city on our Southern border, like Tacoma, Seattle and other points in the extreme Northwest, the outgrowth of railroad extension. The completion of the Mexican National Railway through to the City of Mexico from Laredo last November gave such an impetus to international traffic that in less than six months Laredo can boast all the modern conveniences characteristic of American cities—viz., two steel bridges of six spans each across the Rio Grande, one for railroad purposes and the other for general traffic; an electric light plant, lighting the twin cities Laredo, Tex., and New Laredo, Mexico; a Holly system of works with more than 11 miles of mains; an ore reduction works, an electric motor street railway system, now in course of construction; the Mexican National Railway machine shops, to cost \$600,000, and the largest shops west of the Mississippi River. As a manufacturing center Laredo claims to possess advantages seldom found in growing cities; coal in large quantities at her door, water, light and power in abundance, and her citizens predict that she will become the largest and most important city on the line of traffic between South America, Mexico and the United States.

Lord Lonsdale, who started from the Hudson Bay Company's station a year ago on Arctic exploration, reports that near Peace River he discovered a remarkable formation of salt, and mica in blocks 8 to 12 feet square. In the region of Hay

River he found the Alexandria Falls, about 200 feet high and  $1\frac{1}{4}$  miles wide at the top, which appeared much grander than Niagara.

In Boston, where both the conduit and overhead-wire systems of electric car propulsion have been tested by daily use during the past three months, the latter seems to be regarded as by far the more advantageous. In very wet weather there has been too great a leakage of power from the conduits, and in more than one instance the cars have had to depend on horses for propulsion. Malicious persons, by sticking a bit of iron into the conduit, can at any time make a "short circuit" and stop all cars beyond that point.

The chartering of an iron steamship to load 80,000 bags of sugar at Matanzas, and to tow the barge Atlas with a full cargo from the same destination to the Delaware Breakwater, marks an innovation in the shipping trade.

Colonel Auchmuty, the New York architect and builder, is doing an excellent work in his trade schools in training young Americans to a practical knowledge of such industries as bricklaying, plumbing, carpentering, stonemason work, and the like. It is said that \$750,000,000 pass yearly through the hands of the master builders of this country, and until Colonel Auchmuty started his trade schools, in the absence of the apprenticeship system of the Old World, most of the skilled artisans were foreigners. Two thousand young men have been already graduated from the institution, which he began as an individual enterprise, and are finding their way into good positions throughout the country. They have had every advantage that education can give them, and the final test of their mechanical skill and general efficiency has been reached through examinations, prizes and public exhibitions, which are powerful incentives to good work.

The Newfoundland seal fisheries are this season prolific beyond anything known heretofore. One vessel entered the harbor of St. Johns with 38,000 seals aboard; another took in 32,000, another 31,000, and several others almost as many. Judging from the cargoes already delivered it is estimated that the spring catch will number over 500,000—worth \$1,125,000. The seals are taken on the ice off the east and north coasts.

The Haytien admiral, Howard M. Paterson, ex-instructor of the New York School of Navigation, has come to New York to buy a steamer for the Legitime faction, whose triumph he predicts to be very near.

Claus Spreckels will start the \$3,000,000 sugar refinery in Philadelphia about June 1, and his confidence of success is not a whit abated. He is quite ready to fight the trust on their own ground. The factory for beet sugar erected by him at Watsonville, Cal., at a cost of \$500,000, has declared a dividend of 5 per cent. on the first year's operations. Mr. Spreckels says: "My own idea is that in a few years we will import no sugar. Not only does the beet grow to perfection in California, but it can as easily be grown here in the Central States, and in Kansas particularly. In California we get from it 13 per cent. of sugar to 9 per cent. that the European beet produces. A short time ago the few remaining shares of a \$5,000,000 stock company, of which I own a majority, were subscribed in San Francisco and a new company incorporated, which will be amply able to supply America with beet sugar. After this first year's trial we shall now go into the business on a large scale. Ten new factories at a cost of \$500,000 each will be built in different parts of California. They will turn out only the raw sugar, it having been found impracticable to at-

tempt to refine at the factory during the season. The product will be sold to refiners. The Philadelphia refinery will not handle this beet sugar. It will be wholly devoted to refining the raw imported article. With both of these companies in operation I think I can work against any trust."

The Roosevelt Hospital, in this city, receives by the will of William J. Syms \$350,000, the larger part of this amount to be expended for the construction of a "surgical operating theater."

Letters received from the contractors engaged in building the Chignecto Ship Railway, between the Bay of Fundy and the Gulf of St. Lawrence, report rapid progress, the winter having been very favorable for the work. The success of the project is considered assured, as it has been subsidized by the British Government to the extent of \$170,000 annually for 20 years. The railway is 17 miles in length, and the contractors agree to have it finished about August, 1890. It is being built on the same principle as the proposed Tehuantepec Ship Railway. The engineers and builders are Benjamin Baker and John Towler, the latter known as having built the great bridge across the Firth of Forth, in Scotland, and ranking high among modern engineers.

Sea post-offices on the mail vessels plying between the United States and ports in Europe, after the manner adopted on our interior mail routes, is a suggestion worthy of consideration. Attention is directed to the fact that much delay is occasioned in the delivery of the mails owing to the fact that they have to be assorted and distributed after being landed at the port of destination of the steamer. The suggestion is made by the German post-office authorities in Berlin that Germany and America share equally the expense of employing clerks for the distribution of the mail while crossing the ocean, so that when the mail arrives at the port of destination it will have been assorted for all the large distributing offices, either in Germany or the United States.

Crop accounts carefully collected from all parts of California give assurance of an enormous harvest the coming season. The wheat fields are already heading out rapidly and promise the largest crop ever known. Fruit and vines look well.

The companies whose poles have been removed from the streets by Mayor Grant's orders are smarting severely at the penalty of delay. Many of the poles cost \$100 each, aside from the work of erecting them and stringing the wires.

The sunken steamer Atlas, in the North River, was moved several hundred feet, when unfortunately the swash from a passing steamer caused the chains to break from the pontoons and she again sunk.

The big Rockaway Hotel, which cost over \$500,000 to carry out the first building plans, and nearly double that sum before it was completed, was sold for \$27,000 to C. F. Southard & Co., dealers in building materials.

Yellow fever has already taken one victim in Florida this season, the disease having appeared at Sanford, about six miles from Enterprise. Surgeon-General Hamilton and the State Board of Health have been in conference to prevent the spread of contagious diseases. Those points are believed to be most exposed which escaped last year, as residents who have once been through the ordeal are supposed to be comparatively safe.

The new floating palace Puritan, of the Fall River Line, fully realizes expectations, the working of the engines being perfect.

Andrew Fletcher, of the W. & A. Fletcher Company, who built the engines, said after the first trip that the Puritan will easily travel 21 miles an hour. "The record of the run," said Mr. Fletcher, "shows that the boat made over 20 miles an hour, and that, too, under only 65 pounds pressure. Her regular pressure will be 110 pounds. The run from Watch Hill to Point Judith—a distance of 20 miles—was made in one hour, and the engineers declared that even then the steamer did not develop within 800 of her horse-power."

## MANUFACTURING.

### Iron and Steel.

A press dispatch from Youngstown, Ohio, under date of the 24th inst., says: "The findings of Theodore Hall, to whom was referred the application of Dan P. Ellis and others for the dissolution of Brown, Bonnell & Co., were filed to-day. The referee was appointed in 1884, and the amount involved is \$2,000,000. Referee Hall finds that it would be beneficial to the stockholders if the corporation should be dissolved and its affairs closed up. The delay in the rendering of the decision was done with the hope that before this time the corporation would have been able to discharge its obligations fully."

The nail factory of the Kelly Nail and Iron Company, at Ironton, Ohio, is not in operation at present.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have just closed a contract with the Belmont Nail Company, of Wheeling, W. Va., for a third Gordon, Whitwell-Cowper fire-brick stove.

Carnegie, Phipps & Co., Limited, of the Homestead Steel Works, at Homestead, Pa., have succeeded in turning out 24-inch beams. The new beams are for Cramp & Sons, shipbuilders, and are to be used in the construction of one of the Government's new cruisers.

The Emaus Pipe Works, at Reading, Pa., are at present filling an order for 400 tons of 3-inch cast-iron water-pipe for shipment to South America. The works are running to their full capacity. The owners had contemplated the enlargement of their plant this summer, but they have now decided not to make any changes until the present general business stagnation has changed very materially for the better.

The entire plant of the National Tube Works Company, at McKeesport, Pa., is in full operation and is turning out about 86 carloads of pipe every 24 hours.

On the 26 ult. the Swindell & Smythe Company, engineers and contractors, of Pittsburgh, received a contract for the erection of a fuel gas plant, consisting of a fuel gas generator and the converter furnaces, from the Montreal Rolling Mills Company, of Montreal, Canada. The first-named firm inform us that this is the first contract ever given by any concern not located in the United States for the erection of a fuel gas plant and the result of the experiment will be watched with considerable interest.

The nail factory of the Junction Iron Company, at Mingo Junction, Ohio., closed down on the night of the 20th ult. for an indefinite period.

The rolling mill of the Wheatland Iron Company, at Wheatland, Pa., which has recently been leased by some capitalists, is now ready for operations and is only waiting for orders, according to the superintendent, Thomas Woods. The large hydraulic machinery is said to be perfect

in every department. The puddling department will undergo several slight changes before being put into operation.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., closed down on the 24th ult. for an indefinite period.

The assignee of the Reading Iron Works has issued orders to start up the large pipe mill of the company on Monday, May 5, for the purpose of finishing a large quantity of pipe which was under process of manufacture at the time of the suspension of the company.

A consignment of 1750 tons of manganese ore from Turkey, for use at the Edgar Thomson Steel Works, at Braddock, Pa., was received at Baltimore last week.

The new plant of the Latrobe Steel Works, at Latrobe, Pa., is rapidly approaching completion, and will be ready for operations at an early date. The following are the officers of the new concern: Marriott C. Smyth, president; Walter H. Bryant, secretary and treasurer; Guillaem Aertsen, manager; and Julian Kennedy, chief engineer. Previous to going to Latrobe Mr. Kennedy was located at the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa.

No. 2 furnace of the Pennsylvania Steel Company, at Steelton, Pa., is idle at present undergoing extensive repairs. It will be ready for blast at an early date.

Work on the new plant of the Youngstown Bridge Company, recently organized at Youngstown, Ohio, will be pushed to completion as rapidly as possible. J. M. McDonald, formerly with the Morse Bridge Company, is supervising the erection of the works.

The foundations for the new rod mill now in course of erection by the New Castle Steel Company, of New Castle, Pa., are almost completed, and it is expected that the plant will be ready for operation early in August next. About 150 tons of wire rods will be turned out every 24 hours, about half of which will be used by the New Castle Wire Nail Company, of that place, the balance being sold in the open market. The works will give employment to about 100 men.

We are informed that the report that the nailers in the employment of the Bellaire Nail Works, at Bellaire, Ohio, had concluded to accept a reduction of 35 per cent. in their wages and resume work is without foundation. The nail factory of this firm has been idle for some months, and will not resume operations until there is a decided improvement in the nail trade.

The Sharon Steel Casting Company, of Sharon, Pa., are about to commence the erection of an open-hearth steel-melting furnace, which when completed will add considerably to the capacity of the plant. The firm report that they are enjoying an excellent trade.

The plant of the Stony Creek Iron Company, Limited, at Norristown, Pa., which, for the past few years, has been running spasmodically and has been idle since early last fall, resumed operations on Tuesday, the 23d ult., giving employment to about 200 men. This was brought about by a proposition advanced to the Stony Creek Iron Company by many of their old and most trusted employees, and accepted by the company. An agreement growing out of the proposition has been signed by the firm and most of the men. Under this agreement a scale of wages has been adopted, based on the selling price of iron. The men are to be informed as to

what the company receive for their product, and for every increase of \$2 per ton in the selling price the men are to receive a proportional increase in wages.

The strike at the plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., mention of which was made in these columns last week, still continues with but little prospect of an early settlement. Thus far there has been no outbreak, but trouble is liable to occur at any time. The officials of the company called on the Sheriff of Allegheny County for protection from the strikers and a detail of officers was sent to Duquesne from Pittsburgh, and are now guarding the works. It is said that several attempts have been made to start up a portion of the mill, with only partial success. At this writing every department of the works is idle. At a meeting of the stockholders of the company, held in their office in Pittsburgh last week, the old board and officers, consisting of E. L. Clark, president; H. P. Smith, secretary and treasurer; William G. Park, Robert B. Brown and D. E. Park, were re-elected.

The Cherokee Land and Iron Company, of New Birmingham, Tex., have been re-organized, a new company with an increased capital being formed under the name of the New Birmingham Iron and Land Company. The following officers and Board of Directors were elected: Mr. H. H. Wibirt, of New York, president and treasurer, and Mr. R. L. Coloman, first vice-president and general manager. The Board of Directors comprises H. H. Wibirt, of New York; R. L. Coleman, of New Birmingham; W. H. Hamman, of Calvert, Tex.; A. B. Blevins, of New Birmingham; Thomas G. Utley, of New York; John C. Hertle, of New York; O. H. LaGrange, of New York; Charles B. Wibirt, of New York, and Henry T. Kent, of St. Louis. The new blast furnace is to be pushed vigorously, and the drawings for a rolling mill are being prepared. A railroad is to be built from New Birmingham to the International and Great Northern Railroad.

### Machinery.

Stewart, Corsey & Co.'s iron foundry, at Wichola, Kan., was burned on the 18th inst.; loss, \$50,000.

The valuable machinery of the Harlem Electric Light Company, in East 122d street, was destroyed by fire on Thursday night. The entire loss is about \$125,000.

We have received from the Chattanooga (Tenn.) Machinery Company a catalogue showing their special saw-mill and wood-working machinery, and also the steam pumps, engines and supplies made by them. The catalogue is illustrated by clear engravings, accompanied by brief descriptions of the construction and operation of the many machines shown. The price of each machine is given.

The Williams Engine Works are to have a Shaw electric traveling crane for their new shops at Beloit. It will have a span of 40 feet and be proportioned for a working load of 15 tons, but is to sustain a test load 50 per cent. in excess of this, or 22½ tons, without injury. It is being built by E. P. Allis & Co., of Milwaukee, who have had one of these cranes of 25 tons' capacity in operation in their foundry for several months.

### Hardware.

Henry Diston & Sons, Philadelphia, Pa., are running full time with a force of over 2100 hands, and are turning out 400 dozen of handled saws daily, besides circulars, cross-cuts, &c.

The Gulf Wire Company have been organized in New Orleans for the manufacture of fence wire and wire goods. Of this

company Maximilian Herrmann is president; John M. Wiemann, vice-president, and Fred. Peters, treasurer. The works are located at the corner of St. Joseph and South Peters streets, and operations have been commenced.

The Putnam Nail Company, Boston, Mass., are making large additions to the works at Neponset, which will double their capacity. They recently shipped to San Francisco, Cal., four carloads, aggregating nearly 50 tons, of Putnam nails. This is probably the largest shipment of horse nails ever made, on *bona fide* orders. Mr. Ed. Brubaker, who is now on the Pacific Coast, was largely instrumental in bringing about this consignment.

The Water Elevator Purifier Company, of Cincinnati, report that their trade has increased over 100 per cent. during the year past; they are now about 1200 pumps behind their orders, while orders continue to come in. Many complimentary letters are being received daily from their agents testifying to the appreciation of the many new improvements recently added to the business.

#### A New Furnace Company.

The Monongahela Furnace Company has recently been organized at Pittsburgh during the present week. The stockholders of the new company are identified with the National Tube Works Company, of McKeesport, Pa., although in every respect the new concern is an independent corporation. The following is a partial list of those interested: David W. Hitchcock, Edmund W. Converse and William S. Eaton, of Boston; John H. Flagler, E. C. Converse, of New York; C. I. O'Connor, Horace Crosby and J. R. Jackson, of Pittsburgh. As soon as the charter has been granted, an organization meeting will be called, at which the necessary officers will be elected. At the present time nothing definite has been settled concerning the details of the organization. It is the purpose of the company to erect two blast furnaces on property recently purchased in McKeesport, in close proximity to the plant of the National Tube Works Company. They will be models of their kinds as to size, construction and equipment, and will be fitted up with all the latest improvements and will, no doubt, upon their completion, rank among the finest-equipped blast furnaces in the country. While the exact dimensions have not as yet been decided, it is expected each one will turn out about 175 tons per day each.

The greater part of this product will be consumed by the National Tube Works Company and other industrial establishments in McKeesport, while the balance will be sent to Pittsburgh and other points. The construction of the furnaces will be commenced in a short time, and they will, in all probability, be ready for operations at the close of the present year. As soon as the organization is completed, they will acquire possession of the Edith Furnace Company, of Allegheny City, Pa., who have been operated during the past three years by a corporation consisting of the following named gentlemen: John H. Flagler, E. C. Converse, J. R. Jackson, Horace Crosby and C. I. O'Connor. The Edith Furnace, under the management of the above named gentlemen, who are the owners and constitute the board of directors, has been a very successful plant, and these directors will occupy corresponding positions in the new enterprise, so that the Monongahela Furnace Company, while seemingly a new organization, nevertheless starts out under the guidance of directors thoroughly experienced in the business. We are advised that an arrangement has been made with

the different lines of railroads entering McKeesport, by which that place has been taken into what is known as the Pittsburgh district, and will secure the same rates on stock as are granted to all furnaces in the Pittsburgh district. This is an important concession and will allow the company to compete in the open market with Pittsburgh concerns.

#### Freight Matters.

The freight agents of the various railroads having connections with Pittsburgh have decided on the rail and lake rates from that city to the Northwest. To St. Paul, Minneapolis, Stillwater, &c., by way of Cleveland and Duluth, the rates are 81½, 72½, 52½, 35, 29 and 24. Articles of iron and steel manufacture in less than carloads take a rate of 29 cents; in carloads, 27 cents; railroad supplies in carloads, 21½. The new rates went into effect on Monday, the 29th ult.

The freight agents of the railroads having connection with Youngstown, Ohio, have reduced the pig-iron rates to and from Mahoning Valley points. The new pig-iron rates to Cleveland and Akron from these places are 60 cents for cinder and 65 cents for pig iron. The rate on cinder from the valley points to Pittsburgh has been reduced from 65 cents to 60 cents, and pig-iron from 80 cents to 65 cents. The rates to Uniontown and Scottsdale will be \$1.30 for scrap iron, blooms, &c., and \$1.15 for pig-iron and muck iron. These rates went into effect May 1.

The Union Pacific Railroad Company have made arrangements to receive Pittsburgh freight for Tacoma, Seattle, Port Townsend and Victoria, B. C., direct. They wish shippers to route shipments via Union Pacific Railroad, Oregon Railway and Navigation Company and steamer from Portland. This gives new competition with the Northern and Canadian Pacific Railroads.

#### Ancient Monopolies.

The Canadian *Law Times* prints an edict issued in 473 A. D. by the Emperor Zeno to the praetorian prefect of Constantinople (Code iv, 59):

We command that no one may presume to exercise a monopoly of any kind of clothing, or of fish, or of any other thing serving for food, or for any other use, whatever its nature may be, either of his own authority, or under a rescript of an emperor already procured or that may hereafter be procured, or under an imperial decree or under a rescript signed by our majesty; nor may any persons combine or agree in unlawful meetings that different kinds of merchandise may not be sold at a less price than they may have agreed upon among themselves. Workmen and contractors for buildings and all who practice other professions, and contractors for baths, are entirely prohibited from agreeing together that no one may complete a work contracted for by another, or that a person may prevent one who has contracted for a work from finishing it; full liberty is given to any one to finish a work begun and abandoned by another without apprehension of loss, and to denounce all acts of this kind without cost. And if any one shall presume to practice a monopoly, let his property be forfeited and himself condemned to perpetual exile. And in regard to the principals of other professions, if they shall venture in the future to fix a price upon their merchandise, and to bind themselves by agreements not to sell at a lower price, let them be condemned to pay 40 pounds of gold. Your court shall be condemned to pay 50 pounds of gold if it shall happen through avarice, negligence or any other miscon-

duct that the provisions of this salutary constitution for the prohibition of monopolies and agreements among the different bodies of merchants shall not be carried into effect.

H. C. Frick, chairman of the H. C. Frick Coke Company and Carnegie, Phipps & Co., Limited, of Pittsburgh, has transferred to the H. C. Frick Coke Company his individual interest in a tract of coal land, south of Uniontown, in Fayette County. The property consisted of one-eighth interest in 1690 acres and his one-twelfth of 1020 acres of coal, for which the price paid was \$70,870.15.

John D. Wick, formerly of Wick, Arms & Co., Youngstown, Ohio, has connected himself with the sales department of the Calumet Iron and Steel Company of Chicago.

Lieut. Jacob J. Hunker, U. S. A., Supervisor of the Harbor, has moved into his new office in the Army Building, in Whitehall street.

Minister Palmer, who is about to sail for Spain, was honored by a banquet in Detroit Tuesday night.

Judge Yates acted an honorable part in voting for the Fassett Prison bill and expressing his commendation in words.

The formal opening of the Engineers' Club took place on Saturday, April 27, at the club house, 10 West Twenty-ninth street, New York. The building is one of the old-fashioned large dwellings and is admirably adapted to club purposes. The new club has simple but elegant appointments and promises to become very prosperous. The membership now exceeds 350, of whom about one-half are residents of New York and its suburbs, while the non-resident members include engineers from all parts of this country, Canada, Mexico and South America. The following officers were elected: James A. Burden, president; W. R. Towne, of Stamford, and James C. Bayles, vice-presidents; A. C. Rand, treasurer, David Williams, secretary, in whose absence C. Kirchoff, Jr., acts as secretary *pro tempore*, and the following managers: F. S. Witherbee, of Port Henry, N. Y.; J. F. Holloway, W. A. Perry, Prof. T. Egleston, J. C. Platt, Jr., Waterford, N. Y.; William Metcalf, of Pittsburgh, Pa.; Andrew Carnegie, C. E. Emery, Dr. R. W. Raymond, Edward Cooper, F. R. Hutton, B. S. Church and Charles Macdonald.

Ex-Governor Pillsbury, of Minnesota, has given \$150,000 to the State University to establish a Hall of Science.

John C. New, Consul-General to London, has taken his departure.

Robert P. Porter, Commissioner of the Census, has entered upon his duties.

The Canadian Premier, Sir John Macdonald, replies to a deputation applying for railway subsidies, that the state of the public finances demands caution, and he intimates that the day for generous subscriptions has ended.

The Solid Ingot Company, of Newark, N. J., have sent out photographs showing admirably the fracture of steel ingots cast by their method, and contrasting them with ingots cast in the old style.

# The Iron Age

New York, Thursday, May 2, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## The Western Iron Trade.

For several years the month of April has not been characterized by an active condition of business in the West. But each year there were peculiar circumstances affecting the consuming interests and interfering with trade prospects which were thought exceptional in their nature. For instance, in 1886 the eight-hour agitation was a very prominent factor in unsettling business enterprises, in 1887 the railroads precipitated a condition of chaos by their rearrangement of freight rates in order to comply with the provisions of the Interstate Commerce act, and in 1888 the railroads were again charged with causing an unsatisfactory state of trade by their controversies with their employees. In each case the opinion was generally entertained that if the special disturbance had not occurred there would have been a fair volume of business and prices would not have dropped. This year, however, the exceeding quietness of trade cannot be ascribed to any such specified cause, yet the dullness is much more profound and far-reaching than during the periods previously cited. There are no strikes in progress which affect any considerable number of workmen, and even the threatened strike of Chicago carpenters for a uniform working day is having no effect on the local trade of that city. Of course the dullness must be accounted for in some way, and the railroads afford a convenient scapegoat. They are purchasing very sparingly, and as long as they are so economical business must perforce be dull.

Assuming that this view of the case is thoroughly sound, especially as it is so well fortified by corroboratory circumstances, it simply puts April of this year in line with April of last year and of the year before, and so on. No matter what the cause may be, April seems predestined to be a dull month, whether one thing or another must happen to make it such. We ignore the fact that February and March were months of reasonable activity in iron circles, even though the railroads were buying as sparingly then as in April. With the quietness of previous corresponding periods intensified this year, the month of April has seen lower prices for most iron and steel products than were ever before known in the West. Competition between sellers has been very bitter, notwithstanding the comparative insignificance of the prizes contended for in the shape of small orders. At present writing there is less business transacting in heavy material than at any time of the year for several years, and prospects are not bright for a speedy improvement.

But what of the future? It is on just such a condition of affairs as now obtains that the foundations for a rapid appreciation of values are laid. Manufacturers get discouraged and withdraw from a business

in which they are merely wasting their substance instead of increasing their accumulations. A movement of this kind has already begun, and the voluntary withdrawals are accompanied by others whose retirement has been hastened by legal process. A continuance of this depression throughout May and June would result in such a decided restriction of production that the supply would be found unequal to the demand, and the usual after-harvest activity in all branches of business would send prices upward with a bound.

Considering the excellent financial condition of the country, the abundance of unemployed capital, the absence of disturbing influences generally, and the progressive nature of our people, it is impossible that trade should continue to go from bad to worse until we reach a finality of universal ruin. The downward course will be checked, and will probably be checked very suddenly, as is the case with all reactions. Then there would be danger of a "boom," which is to be feared and if possible avoided. The boom of '79-'80, with its wild excesses and extravagant transactions, was a serious blow to legitimate business whose effects were felt for years. We desire and need prosperity, but not of such a violent character. Yet with all the dullness existing at present, this prospect looms up in the future. If the railroads are really as bare of necessary supplies as they are represented to be, and are in as great need of track materials and rolling stock as is reported, they will all be in the market about the same time and their purchases will enormously stimulate trade. It is a time for caution and conservatism by manufacturers, particularly in making contracts for long-time deliveries. Materials of all kinds are low, wages in Western mills are not likely to undergo any change of consequence, and it appears altogether incredible that six months from to-day the prices now prevailing will seem high.

## Uniform Freight Classification.

There is one subject of importance to all business interests which has not yet received much public discussion. We allude to compulsory uniformity in the classification of freight by our transportation companies. It will be remembered that Congress came very near passing a bill compelling the railroads to unite upon a classification at a date now passed. Acting upon this hint the Interstate Commission asked the various State commissioners, at their convention in Washington last March, for their opinion. The result was a resolution that "still further advance toward uniform classification of freight will promote the welfare and convenience of shippers." Thus the mercantile community seem committed to the movement through the action of those supposed to represent their interests. It is very questionable whether these gentlemen have fully considered this matter. Several members said that they were not prepared to state their opinion, and in the debate it was apparent that all the consequences had escaped attention. Nowhere is the meaning of the term "uniform" defined. This should have been done long ago.

There are four important classifications

now in use—the Official, between the Mississippi and the seaboard, north of the Ohio; the Western, west of the Mississippi; the Southern, south of the Ohio, and the Transcontinental, for Pacific Coast traffic. Other State or local classifications are also in use within limited areas. These classifications, while having many points of resemblance, differ radically in very important respects, and it is precisely these differences which are aimed at because they affect great staples. These classifications have in process of time come to cover sections of the country which have uniform business methods with similar manufacturing or agricultural products. Hence, as we would expect, we find these articles of traffic, which are native to the territory, given special consideration in each of these classifications, such special rates not being granted in any of the others. This is natural and proper. Cotton, for example, that great Southern staple, receives a special rate south of the Ohio, a favor not found in the Official classification except in competition with Southern routes. California raisins are brought to New York at rates which the railroads are not willing to accept on their general shipments of that article. If "uniform classification" means that the classes or rates ruling in one section must be made the basis of rates everywhere in the United States, then every merchant whose business depends directly or indirectly upon the prosperity of his State and upon obtaining the best prices for its special product must be prepared for misfortune.

There is another point. Under the present system any industry temporarily depressed may find help from the carriers who are most dependent upon its prosperity, a help which must be denied if the reduction were to affect every local road hundreds of miles away. We have had something to say of late upon the necessity of a reduction of freight rates upon iron in the States east of Chicago. But it does not follow that such reduction when made should be accompanied by a similar reduction west of that city. The competition of Pittsburgh and Birmingham with Chicago furnaces is reason enough for a lowering of rates to that city. But west of Chicago no such competition exists, and there is no necessity as yet for any changes. But if the principle of "uniformity" is to be rigidly enforced and reductions east are to be followed by reductions west, it is easy to see that the difficulty of securing any changes, however just, is immensely increased. Must the shipments from any large center like Pittsburgh be governed as to rates by the needs of a little local road for exceptionally high classification or tariffs? And if uniform classification does not mean this, what does it mean? Any single exception allowed would destroy the uniformity and bring on confusion even greater than now.

The whole supposed need for uniformity is founded on a misconception—that differences are of themselves to be condemned. On the contrary, discrimination between persons and things lies at the bottom of all trade. In business these discriminations adjust themselves, but in transportation we must adjust them on a theoretical basis, but they are not of themselves wrong or unjust on that account. Discrimination in classification or in freights between dry goods and pig-iron is ap-



proved by every one. Upon the same ground the Southern classification is right in favoring cotton and the Pacific upon raisins. In like manner low rates on iron in Pennsylvania are more necessary than in Montana. The one is a section where small profits are the rule, in the latter large profits are common, and the same condition is naturally reflected in the tariffs and classifications. It would do violence to business principles to have our railroads compelled to go out of touch with the industries they serve and thus to classify lower in Montana and higher in Pennsylvania.

Under these conditions a committee is now at work trying to unite all differing classifications into one. They find it very difficult, but are still at work. It is high time that the business community took an interest in the question. A definition of terms should be asked of the Interstate Commerce Commission, and with this before them, our merchants should carefully consider whether the commerce of the country would be helped or injured by an enforced uniformity of classification and of freight rates based upon it.

### The Cost of Copper-Mining.

While everybody connected with the copper interest, either as producer, dealer or manufacturer, is forced to wait patiently for developments, the study of some of the questions affecting the future of the metal is timely. Whether or not the magnates among the mining companies, who, we are told, have at last learned to know and respect one another, will succeed in reaching some basis with the financiers who were caught, is a matter concerning which no forecast is possible. The greed of one or the pride of another may upset the fondest hopes of those who believe that an adjustment is possible. The difficulties are so great, complicated as they are by personal motives and interests, that very many well-informed men scout the idea that a *modus vivendi* will be found. Even if something is finally patched up, it must be very radical indeed if it is to inspire confidence. The history of the past year has pretty thoroughly proved that it is a very costly matter to hold the market above its natural level. It is clear that it would be folly even for a Rothschild to keep prices at a point that would encourage a liberal supply and at the same time hamper consumption even slightly. Throughout the trade little sympathy will be wasted either on the mining companies or on the bankers whose eagerness for commissions put them into the uncomfortable position of being holders of copper. Both have reaped what they have helped to sow, and while the companies may contemplate last year's balance sheets with satisfaction, the net returns for the next two or three years may finally raise some doubts as to the wisdom of having allowed themselves to be inveigled into a false move by reckless speculators.

In all the discussion which is now going on one fundamental error seems to have a strong hold on producers and bankers, and that is that within certain limits they possess the power to establish a price. They all concede that M. Sécretan made a fearful blunder, but the conviction seems to be that his cornering operation failed, not because it is impossible to control the market, but because he was altogether too liberal to the mining companies and at-

tempted to extort too high a price. They say, practically, that the thing cannot be done at 16½ cents a pound with unlimited production, but it can be done at 12 cents with a limited output. They assume that the attitude of the seller settles the matter, and seem utterly indifferent to possible effects produced by hostility on the part of the buyers and the trade. The latter, too, may have formed their convictions, and though their voice is not heard in the councils of the magnates, their influence will quickly be apparent in the course of the market.

A point which producers often raise when discussing the question of prices is that the average for a series of years should be accepted as representing the normal value. We believe that view to be erroneous, especially so far as this country is concerned. Ten years ago a few Lake mines controlled the market, and sustained it by exporting a small surplus at a sacrifice. Since then our production cannot be managed by any such methods. Since then costs have been reduced by improved mining methods, by the introduction of more efficient crushing, dressing and smelting appliances, by the lowering of the cost of fuel and supplies, and by cheapening of transportation.

Let it be conceded that to some extent the greater depth of the mines offset this lowering of cost; still a balance remains. We contend that the cost of production to-day, plus a fair profit, an allowance for repairs to machinery and new construction, and a sinking fund to cover exhaustion of deposit, represents the normal price. Under present circumstances that price must be the maximum, because in some way a part of the accumulated stock must be marketed. So far as the Lake mines are concerned the bare cost of production is easily arrived at. The annual reports of a number of companies allow us to figure it out quite closely. The Tamarack, the young neighbor and rival of the Calumet and Hecla, reported on June 30, 1888, that the cost of its copper laid down in New York, all expenses paid, was 5.75 cents. Including all expenses for construction and for development work the cost was 7.20 cents a pound, based on a yield of 3.6 per cent. of ingot. The figures for the Calumet and Hecla are not known, but its rock is nearly 1 per cent. richer and its operations are on a much grander scale, so that its cost should certainly not be so high, in spite of heavy outlays for new construction and development. For the other leading mines we have the figures for 1888 as follows:

	Product.	Gross expenditure.	Cost per pound.
Franklin.....	3,655,751	\$406,583.02	11.12
Oscoda.....	4,134,320	479,873.42	11.61
Quincy.....	6,387,809	500,860.24	7.86
Atlantic.....	3,974,972	435,683.93	10.96
Central.....	1,817,023	196,605.55	10.76

Of course during 1888 the majority of the mines went into exceptional expenditures for new machinery and development. All of them pushed their output vigorously, and a tendency was observed to handle lower grade rock, since it yielded a profit at high prices. On the basis of the figures given, a good profit could be realized by the Calumet and Hecla with an output of about 50,000,000 pounds, the Tamarack, which is producing at the rate of 15,000,000 pounds, and the Quincy, which may be placed at 6,000,000 pounds, a total of 71,000,000 pounds of ingot.

We possess little public information concerning the capacity of the Montana mines to meet low prices. The annual report of the Boston and Montana Company, at Butte, showed that the running expenses were \$740,714.32 on a product of 8,815,987 pounds fine, an average of 8.41 cents. Including construction and a payment for mining and smelting property purchased, the outlay was \$931,667.48, or 10.59 cents per pound. But the mine is now producing at the rate of 2,000,000 pounds a month, so that 9½ cents for casting brands is not likely to close it down. The Anaconda, with a product of 60,000,000 pounds, has leaner ores, but this may be compensated for by working on a very much greater scale. These two must depend upon the limited capacity of domestic refineries to convert their matte into merchant copper. A considerable part of the matte must be exported, and therefore will depend upon the English market. The Parrott, with a product of about 10,000,000 pounds, has its own refinery at Bridgeport and has close relations and a good trade in the Naugatuck Valley. Its capacity to meet low prices is not doubted in the trade.

In Arizona, companies representing an output of about 15,000,000 pounds would certainly continue at 9½ cents, and with their well-known reputation for quality would receive the preference over other brands. Assuming that the Lake, Arizona and Parrott copper remained at home and that one-half of the Anaconda and Boston and Montana were refined for the market, the supply to it would be 138,000,000 pounds of new copper, certainly enough to cover all our home requirements, and leave 42,000,000 pounds for export. In other words, three mines each in the Lake, Montana and Arizona districts could sell at 9½ and 10 cents respectively, running at a moderate rate, and leave a profit to their owners. To these concerns a 12-cent market would yield very handsome profits, while it would give life to a number of second-rate producers.

### Iron Railroad Ties in Germany.

The efforts being made in this country, feeble as they are, to introduce iron as a substitute for wood for railroad ties may be prejudiced by the developments in Germany during the past few years. That country was the first to introduce the use of steel sleepers on a large scale, and was followed later by the railroads in other Continental countries, in Great Britain and in India. For some time past, however, the authorities—the greater part of the German railroads being operated by the State—have turned back to wood as a material. This movement has been viewed with much alarm by German ironmasters, and has resulted in a vigorous agitation on their part. At the last meeting of the Association of German Ironmasters H. Brauns, the general manager of one of the leading steel works of the country, presented a paper containing many interesting data. Its general tone and the arguments advanced are characteristic of appeals made to a paternal government. He seeks to establish the justice of his cause by pointing out that German interests are injured by substituting for steel ties, on which the State railroads secure income by hauling raw materials, wooden ties, a large proportion of which must be imported, because the forests of Germany cannot cover the whole demand. He estimates that 1,800,000 wooden ties are im-

ported. Taking about 110 pounds as the weight of a steel sleeper, they displace a possible consumption of 90,000 tons of iron. The freights on ore, coal, limestone, &c., to produce this quantity in the Rhenish provinces and Westphalia will average 15 marks, equal to a loss of gross earnings to the railroads of 1,485,000 marks. The wages, which will average 37.50 marks per ton of product, add 5,568,750 marks more of which national industry is robbed. All this money, Herr Brauns urges, should be kept in the country.

The statistics showing the quantities of wooden and iron ties put into the track of the Prussian State railroads and of all the German roads are well calculated to create uneasiness, the figures for a few years being:

Wooden and Iron Ties put Into Track. Prussian State Railroads.					
Year.	Wood. Number.	Iron. Number.	Per cent.	Per cent.	
1885-86.....	1,507,363	672,086	69.16	30.84	
1886-87.....	1,582,877	522,470	75.18	24.82	
1887-88.....	1,654,304	498,628	77.02	22.98	

All German Railroads.  
1885-86..... 2,482,004 1,007,152 70.97 29.03  
1886-87..... 2,544,992 868,262 74.56 25.44  
1887-88..... 2,677,424 750,670 78.10 21.90

The figures clearly show that steel ties are losing ground absolutely and relatively, and that the Prussian State railroads are taking the lead in what the ironmasters call the retrograde movement, since their proportion of the whole, which was 66.7 per cent. in 1885-86, fell to 65.7 per cent. in 1887-88. The estimates of the administration of the Prussian railroads indicate that they propose to persist in the same direction, since the budget calls for an expenditure of 9,810,220 marks for wooden ties, against only 4,168,886 marks for iron sleepers. The estimate for 1889-90 includes 33,514 tons of sleepers, while it calls for 78,770 tons of rails and 24,247 tons of fastenings, figures which show how important this matter is to the iron works.

During the discussion which followed Herr Brauns' paper no points were touched which might throw light upon the reasons for the change of policy on the part of the railroads. It is somewhat difficult to understand how a revulsion of sentiment among German railroad engineers can have taken place without good and sufficient reasons, from their standpoint. One fact, however, was brought out, which is certainly surprising. It appears that the administration of the Prussian State roads estimate the life of steel sleepers and ties at 15 years, or the same as that of oaken ties. Exact data are, of course, wanting, because a sufficiently long period has not elapsed to furnish figures upon which the life of steel ties can be even approximately estimated. Still, it appears utterly contrary to all experience to assume that a steel tie, subject to no wear, should not long outlast a rail, the life of which under ordinary conditions often far exceeds 15 years.

One of the speakers submitted data relating to the cost of steel ties as compared with oak, which we tabulate as follows:

Cost of Ties in Germany, in Marks. Steel.					
	1.	2.	3.	4.	5.
Tie-weight, kg.....	54.2	53.0	57.0	53.0	57.0
Tie.....	8.39	6.25	6.72	6.25	6.72
Hook plates.....	1.19	1.19	1.19	1.19	1.19
Fastenings.....	0.71	0.40	0.40	0.74	0.74
Totals.....	7.10	7.84	8.31	6.99	7.46
Value as old material.....	2.77	2.92	3.12	2.78	2.98
Net.....	4.33	4.92	5.19	4.21	4.48

All the ties are placed at a cost of 118 marks a ton, equal to, roughly, \$28 a gross ton, while the oak ties cost about \$1 apiece. In this country steel ties can be contracted for on a large scale at the rate of about 2 cents per pound, one of the leading concerns in Pittsburgh having agreed to deliver the finished tie at that rate. Still, the prospect of their introduction on a large scale in this country is not very promising as yet. Very few of our railroads are in a position to carry along as an asset any heavy quantity of steel for its possible value as old material in decades to come.

#### Our Trade with American Nations.

The Bureau of Statistics at Washington has just published details of the trade of the United States in 1888 with other American countries as compared with the previous calendar year. We have used those particulars for extracting therefrom a table showing—reduced to thousands of dollars—the trade, in merchandise only, done with countries situated south of us, and another grouping together the Northern countries. The percentage of gain in our domestic export southward is highly gratifying, inasmuch as it has amounted to 8 per cent., the increase of import being 4 per cent. On the other hand, the export to Northern countries hardly shows any gain at all, the import thence increasing 9 per cent.

#### Trade of the United States with the rest of America.

In thousands of dollars.	Domestic export.		Import.	
	1888.	1887.	1888.	1887.
Argentina Republic.....	6,146	5,911	5,466	4,977
Bolivia.....	11	17	2	2
Brazil.....	8,181	7,104	55,259	56,378
Costa Rica.....	934	1,045	1,412	2,085
Guatemala.....	998	676	1,877	2,729
Honduras.....	657	575	1,258	994
Nicaragua.....	833	799	1,733	1,536
Salvador.....	698	574	1,670	1,132
Chili.....	2,188	2,377	2,437	2,631
Danish West Indies.....	601	632	471	430
Ecuador.....	863	808	812	1,195
French West Indies.....	1,761	1,459	43	358
French Guiana.....	182	146	19	7
British West Indies.....	7,787	7,007	14,304	12,221
British Guiana.....	1,636	1,551	3,823	3,165
British Honduras.....	358	394	219	198
Hayti.....	3,954	3,763	3,178	1,885
Mexico.....	9,607	8,370	17,629	16,294
Dutch West Indies.....	551	553	366	258
Dutch Guiana.....	277	241	462	457
Peru.....	752	629	318	419
Santo Domingo.....	910	957	1,401	1,324
Cuba.....	10,990	9,146	50,203	45,393
Porto Rico.....	2,054	1,863	3,728	4,516
Colombia.....	4,807	5,557	4,612	3,795
Uruguay.....	1,389	1,382	2,734	2,386
Venezuela.....	3,063	3,049	9,016	9,921
Totals.....	72,093	66,725	184,462	176,634
Miquelon.....	872	329	30	42
Nova Scotia, New Brunswick and Prince Edward Island.....	3,148	2,582	6,016	5,760
Quebec, Ontario, Manitoba and Northwest Territory.....	29,351	30,223	33,766	33,709
British Columbia.....	1,697	1,450	4,123	1,825
Newfoundland and Labrador.....	1,411	1,265	1,650	184
Greenland and Iceland.....	.....	.....	99	138
Totals.....	35,979	35,849	45,684	41,658

#### RECAPITULATION.

Countries south.....	72,093	66,725	184,462	176,634
Countries north.....	35,979	35,849	45,684	41,658
Totals.....	108,072	102,573	230,146	218,292

	Total trade.	
	1888.	1887.
Argentina Republic.....	11,612	10,888
Bolivia.....	13	17
Brazil.....	63,420	63,482
Costa Rica.....	2,346	3,080
Guatemala.....	2,845	3,406
Honduras.....	1,915	1,569
Nicaragua.....	2,566	2,385
Salvador.....	2,363	1,706
Chili.....	4,625	5,008
Danish West Indies.....	1,072	1,062
Ecuador.....	1,675	2,008
French West Indies.....	1,804	1,817
French Guiana.....	171	153
British West Indies.....	22,091	19,228
British Guiana.....	5,454	4,716
British Honduras.....	577	582
Hayti.....	7,132	5,648
Mexico.....	27,236	24,664
Dutch West Indies.....	917	811
Dutch Guiana.....	739	698
Peru.....	1,070	1,248
Santo Domingo.....	2,811	2,281
Cuba.....	61,198	54,539
Porto Rico.....	5,732	6,379
Colombia.....	9,419	9,352
Uruguay.....	4,123	3,768
Venezuela.....	12,079	12,970
Totals.....	256,555	243,359

Miquelon.....	402	371
Nova Scotia, New Brunswick and Prince Edward Island.....	9,164	8,342
Quebec, Ontario, Manitoba and Northwest Territory.....	63,117	63,632
British Columbia.....	5,820	3,275
Newfoundland and Labrador.....	3,061	1,449
Greenland and Iceland.....	99	130
Totals.....	81,663	77,507

#### RECAPITULATION.

Countries south.....	256,555	243,359
Countries north.....	81,663	77,507
Totals.....	338,218	320,866

The conclusion arrived at from the results disclosed by these comparisons is that the rise in coffee and sugar, as well as temporarily in hides, has increased the purchasing capacity of countries south of us so much last year that they have absorbed American products more freely. A gain of 8 per cent. in a single year is not a small matter, and encourages the very best expectations for the current year, in which sugar has so far advanced in a manner almost unprecedented. This advance will encourage the planters to extend their estates and enlarge their capacity of production by ordering more American machinery, &c. Should, on the other hand, our own crops be as abundant as they promise at this early stage, it will cheapen our flour, provisions and canned goods, and the bulk of what we shall ship southward during the latter half of 1889 will be all the greater. Since our export to Spanish America and Brazil is to be pushed this year with renewed vigor, everything will co-operate, we trust, to give as favorable results as those exhibited, perhaps even more brilliant ones, although another similar percentage of increase would no doubt fully satisfy our exporters and manufacturers.

Mr. Charles R. Stowell, bridge engineer of the New York Railroad Commission, has prepared a complete list of the railway bridge failures of last year, so far as reported, with the name of the road and circumstances attending each. The number of such failures in 1888 was 32, of which 1 was by fire, 10 by freshets, 3 while undergoing repairs, 6 were knocked down by trains, 5 were square falls, and 7 failed from unknown causes. Mr. Stowell also has statistics covering failures for ten years past, omitting the first two years, for which the record is presumably imperfect, 239 bridges having fallen in eight years, or within a fraction of 80 per year. In the meantime, however, the railway mileage has enormously increased—from 93,349 at the beginning of 1880 to 149,913 at the beginning of 1888, an increase of 60½ per cent. When this is considered the record of failures shows a gratifying decrease.

### Freights in the Lehigh Valley.

Alleged discrimination in freight rates in the Lehigh Valley is the subject of grievous complaint. A prominent iron manufacturer in an interview said that Reading and the entire Schuylkill Valley is being discriminated against by the railroad companies; that this discrimination extended to all the inland cities and manufacturing towns, with the result of driving trade to the seaboard. He characterized it as a short-sighted policy which, if continued, would kill trade in and about Reading altogether. The excessive freight rates, he thought, had as much as anything to do with the failure of the Reading Iron Works. He said: "All the rates of the railroad companies are now being made in favor of the long haul. When we complain of this they answer us that they cannot lower local rates one particle without losing money, for the reason that every ton carried on a long haul entails an actual loss. Such action does not display any ability, for it simply crushes out local trade, reducing their business on short hauls. It is killing the goose that lays the golden egg. Our rates in this city and this valley are so high that it is impossible to manufacture at a profit. The freight on coal and iron on short hauls is 2 and 3 cents per ton per mile, while on long hauls it is from  $\frac{1}{2}$  to 1 cent. For Southern iron the rate is  $\frac{1}{2}$  cent per ton per mile, and I know one furnaceman in the South who has a contract for ten years at  $\frac{1}{2}$  cent per ton for both long and short hauls. At our rates it is impossible to compete with these people. Two weeks ago the Lehigh Valley and Philadelphia and Reading railroad companies lowered their rates to Philadelphia, New York, Buffalo and other large markets, but our local rates have not been touched. From the Schuylkill coal fields to this city the tolls on coal are 80 cents to furnacemen and \$1.40 for domestic consumption. All manufacturers, except furnacemen, must pay the domestic rate. The haul from the Lehigh coal fields to Bethlehem, Allentown and Catasauqua is no longer than from the Schuylkill region to this city and yet the rates are 20 per cent. lower. The furnace rates to these places are 65, and the domestic rates \$1.10 and \$1.15. The toll on a ton of coal to Philadelphia is but 40 cents a ton more than to this city. This discrimination against Reading is slowly but surely closing our factories, and if it continues will deal a death blow to all our industries." This is a fair reflection of the sentiment of all the manufacturers of the Schuylkill Valley on this subject. These complaints extend not only to the local rates on coal ores and iron, but to the policy which leads to the carrying of manufactured goods to New York, Philadelphia and other markets from points of production much further away at rates either absolutely less in amount or much less in proportion to the distance.

Sunday freight trains are being discontinued so far as practicable on the Vanderbilt lines as well as on the Pennsylvania road. The new arrangement will take effect May 1, comprising all the Vanderbilt lines east of Chicago. Live stock and perishable freight will be forwarded as usual to its destination. The company expect that when merchants learn that imperishable goods are not moved on Sunday they will calculate accordingly and ship their goods at such time as will prevent loss to either party. In like manner General Manager Hickson, of the Grand Trunk Railway, has ordered that no freight trains be run on Sunday, except those carrying live stock and perishable goods. The Delaware, Lackawanna and Western, also the Delaware and Hud-

son Canal Company are in hearty sympathy with the movement. The New York, New Haven and Hartford road and the New England road have been running, practically, no Sunday freight or excursion trains for two years.

### Wrought-Iron and Steel Eye-Bars.

Carl Gayler, discussing the relative merits of wrought-iron and steel eye-bars before the St. Louis Engineers' Club, reached the following conclusions:

The wrought-iron eye-bar has had its time; steel is rapidly taking the place of iron, and it will not be long before it has superseded iron for pins and eye-bars as completely as the steel rail has taken the place of the old iron rail—and we have no cause to regret this change. Any engineer who has had for a length of time to do with iron eye-bars, and has convinced himself, through tests, of their value, has from time to time met with a lot of bars, sometimes from the most reliable bridge firms, which gave surprisingly bad results; he has, furthermore, among a number of good eye-bars nearly always found a few inferior heads, and if he also recalls to his mind the various fractures in their heads, invariably partly crystalline, often not thoroughly welded and the layers of the piling plates discernible, he will feel little reluctance against trying a new material. The long record of tests of iron eye-bars manufactured for the more important structures of our country shows results which are anything but reassuring, and it is not too much to say that iron eye-bars made by our leading bridge companies under close inspection and with careful tests on the part of the engineer are more unreliable members than any of the rolled or built shapes used in any other part of the bridge. Steel eye-bars have doubtless their weak points also, but we have at least the satisfaction of knowing that the material which we are on the point of abandoning has never satisfied us.

In deciding on the use of steel for eye-bars we have to keep in mind that we deal with a superior, but also with a more sensitive material. To two of the sources of weakness in iron eye-bar heads, *i. e.*, to the effect of unequal heating and to that of chemical impurities, is added the effect of overheating, the proper degree of heat for steel work of any kind being of the greatest importance. The effect of unequal heating is counteracted by the annealing process—by heating the whole bar when completed, but before the final boring of the pin-holes, in a large oven, and then allowing it to cool off slowly. This annealing process is also claimed to restore to some extent the strength of the overheated metal, although I am unable to say how far this claim is justified. As far as chemical impurities are concerned, the influence of too much phosphorus is fatal. Bridge companies have found it necessary to insist on steel containing not over 0.04 phosphorus. The difference between the making of an iron and a steel eye-bar head is characteristic of the two materials. As we have seen, the former is essentially a welding and forging process; the latter is a process by which the heated metal requires merely to be pressed or made to flow into its new shape. Upsetting and shaping, both under hydraulic pressure, with such additional hammering or rolling only as is necessary for a surface finish, suffice to make the steel head. What work is to the iron eye-bar head is heat to the one of steel.

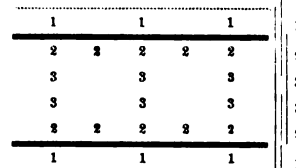
In speaking of steel it is hardly necessary to say that "mild steel" is meant, nor will it probably be disputed that the milder the steel (carbon between 0.10 and 0.20 of 1 per cent.) the more uniformly good the result. The superiority of steel

eye-bar heads, which is proved by the results of tests made so far, is to be accounted for by the homogeneity of the metal; all the doubts about a uniform thorough welding into one fibrous mass, which are so well founded in the case of the iron eye-bar head, are at once removed, and it is in reliance on this difference in favor of steel that the manufacturers, following the example set by the Edge Moor Iron Company, have begun to reduce the size of the steel eye-bar head. It appears now that the investigations and experiments on the best shapes of eye-bar heads, extended through so many years, have had their cause solely in the bad results of insufficient welding, and that in substituting steel for iron we are justified at once in using smaller heads.

The engineer who builds bridges and who, as is often the case, has no chance to visit some of the principal mills and shops of the country more than once or twice a year, may get bewildered if he considers his responsibility in view of all the requirements for good eye-bars, but the way for him is very simple. He has to insist on full-size tests of a sufficient number of finished bars, thus demanding the results from the manufacturer, who has to assume all responsibility for the success of his work, which, of course, implies that the selection of the material, the mode of manufacture and the shape of the heads have to be left to his discretion also. I wish to add here the results of full-size tests of steel eye-bars, made last year on the 1,200,000-pound hydraulic testing machine of the Union Bridge Company, at Athens, Pa., for the Grand Avenue Viaduct, now nearing its completion in this city. The steel for these bars is Bessemer steel from the Carnegie, Phipps & Co. mills, Homestead, Pa. The requirements for the specimen tests were: Elastic limit, 32,000 pounds per square inch; ultimate strength, 62,000–70,000 pounds; minimum elongation, 18 per cent., and the specimens ( $\frac{1}{2}$ -inch round) to bend 180° around their own diameter without showing crack or flaw.

The record kept at the mill of the chemical tests of each blow shows the amount of carbon to vary from 0.13 to 0.16 of 1 per cent., and that of phosphorus from 0.03 to 0.06 of 1 per cent. The eyes were made at the Edge Moor Iron Works, Wilmington, Del., with an excess of material across the eye over the bar of 40 per cent.

The Roberts Iron Works Company, of Cambridgeport, Mass., have been compelled by increase of business to begin plans for an extension to their boiler works of about 100 feet, making the building 302 feet long by 96 feet wide. The longitudinal seams of the boilers made by this company are made as shown in the following sketch, which is a plan and section through the seam:



The outside lap, through which and the shell the rivets 2 3 pass, is narrower than the inside one through which the rivets 1 1 also pass. It is evident that this construction insures the strength of the shell. Another item in the building of this boiler

is found in the stay-bolts, the bodies of which in the 6-foot boiler are  $1\frac{1}{2}$  inches in diameter, while the threaded ends at the heads are  $1\frac{1}{4}$  inches, thus reducing the weight of the bolt by doing away with useless material, without diminishing its strength. Under each nut is placed a corrugated copper washer to hold cement. All boilers made by this company are of steel, and are of ample strength for the pressure required.

### Treasury Decisions.

#### TESTS OF MARINE BOILER PLATES.

The Supervising Inspector-General of Steam Vessels, by direction of the Secretary of the Treasury, has issued the following circular governing the test of boiler plates: "Whereas, it has been reported to this office that boiler-makers in many cases prepare sample pieces of steel and iron plate for testing, varying in form from that required by the rules and regulations of the

### The Influence of Silicon on Steel.

Professor Tilden, Prof. W. Chandler Roberts-Austen and Mr. F. Turner, who were appointed by the British Association as a committee to investigate this subject, give the results of a series of experiments made in the following manner: A weighed quantity of siliceous metal was melted down in a covered crucible, and about 40 pounds of molten basic Bessemer metal taken from the ladle at about the middle of a cast were then run into the same crucible. After allowing the contents to stand for about a minute the metal was poured into another crucible, and then allowed to slowly solidify. Test pieces were cut from the different samples and submitted to mechanical tests, with the results shown in the annexed table; the chemical analysis is also appended. In the summary of the results it is observed that when silicon is added to iron containing manganese it in nowise injuriously affects the ordinary mechanical properties of the metal, provided the percentage of

ceived—that of Bradlee & Co., of Philadelphia, at whose works the cables are now being made. That these fears were unfounded was shown by a test of three links taken from a completed 2-inch cable and tested on the Watertown machine. The breaking strain was 274,200 pounds, or 10 per cent. more than was needed. The iron for these cables is made by Hughes & Patterson, of Philadelphia. It gives a good weld, is homogeneous and has the required tensile strength.

The links are welded at the ends, which are always the weakest parts, as proved by the break always taking place there. It is more than probable that the action of the Government in increasing the strength of cables will cause manufacturers to abandon the end weld so almost universally used in this country, and adopt the side weld in vogue across the water. In the end weld it is an extremely hard job to perfectly unite the inner surfaces owing to the difficulty of supporting the link on the anvil while striking. This in a great measure would

Number of samples.	Chemical analysis.					Works tests.				Mechanical tests.						
	Silicon. Per cent.	Carbon. Per cent.	Sulphur. Per cent.	Phosphorus. Per cent.	Manganese. Per cent.	Rolling.	Hot.	Cold.	Welding.	Limit of elasticity. Tons per square inch.	Breaking load. Tons per square inch.	Ratio of limit to break.	Extension. Per cent. on 10 inches.	Reduction of area. Per cent.	Work done per cubic inch. Tons.	Relative hardness.
1	0.010	0.16	0.050	0.060	0.550	{Roll'd well.}	Good.	Perfect.	Perfect.	22.00	29.64	0.743	23.1	48.8	6.25	
2	0.061	0.16	0.028	0.068	0.619	"	"	"	"	22.21	31.61	0.703	20.4	40.7	5.80	
3	0.070	0.15	0.064	0.061	0.500	"	"	Good.	"	21.05	29.51	0.718	22.9	51.5	6.12	
4	0.022	0.21	0.064	0.064	0.634	"	"	Perfect.	"	22.43	33.66	0.666	19.4	44.1	5.82	
5	0.108	0.13	0.028	0.066	0.662	"	"	Good.	"	21.28	33.57	0.634	20.6	51.4	6.06	
6	0.121	0.19	0.064	0.068	0.576	"	{Good, but rather red-short at welding heat.}	"	"	22.70	31.86	0.712	21.9	48.7	6.31	
7	0.315	0.13	0.028	0.057	0.480	"	Good.	"	"	21.29	29.42	0.724	24.8	56.6	6.32	
8	0.247	0.19	0.028	0.074	0.642	"	"	"	"	22.23	34.70	0.640	17.6	49.6	5.36	
9	0.320	0.15	0.040	0.081	0.490	"	"	"	"	22.22	33.23	0.671	19.7	36.1	4.96	
10	0.382	0.16	0.042	0.087	0.538	"	"	"	"	24.72	35.67	0.693	18.0	30.7	5.79	
11	0.504	0.13	0.094	0.121	0.455	"	"	{Broke short at 50°.}	"	26.35	36.72	0.717	19.4	34.8	6.45	Difference so small as to be scarcely perceptible.

Board of Supervising Inspectors, and that inspectors receive and test the same, not deeming it their duty to object. Such officers are hereby notified that it is their duty to refuse to make tests of boiler material when sample pieces do not correspond, approximately, at least, with the regulations, and in case of the boiler-makers' failure to properly prepare the test-pieces the same should be returned without unnecessary delay, with a letter of explanation giving the reasons therefor. Boiler-makers are informed that the failure of test-pieces to come up to the standard required may be caused from improper manipulation of such pieces, and not from inherent defective qualities in the plates of iron or steel from which the test-pieces are taken, and they are cautioned that any method of cutting off the coupons for testing which requires the sample pieces to be straightened by hammering hardens the material, and is frequently the cause of samples falling short of the required reduction of area required by the rules and regulations, at the same time increasing the tensile strength to a point beyond that which the plates would show if the test-pieces were properly prepared. Coupons should never be sheared, but should be cut off with a planer or chisel. In figuring on the ductility of plate as shown by the reduction of area of section it is not deemed advisable to reject any plate for lack of proper ductility under the rules when such reduction is only a fraction of 1 per cent. short of the standard required by the rules and regulations, as perfectly exact measurement of the broken ends of samples is nearly an impossibility."

silicon does not exceed 0.5. When more than 15 per cent. of silicon is present, both the limit of elasticity and the tensile strength are increased; the extension and the reduction of area are, however, distinctly decreased by the presence of silicon.

### Increased Strength of Chain Cables.

Several important changes were made by the United States Government in the last specifications for so-called lightship cables. The most essential was that relating to the breaking strain, which was ascertained by the following formula determined by Lieutenant Mackenzie:

$$\left(\frac{\text{dia}}{4}\right)^2 1,000,000$$

This for a 2-inch cable gives a breaking strain of 250,000 pounds, which is a most decided increase over any of the requirements prevailing in Europe, the highest of which for a similar chain is that of the English Lloyds, where the breaking strain must be 225,000 pounds. The Government also required, for the first time, a breaking test of three links taken at random, and also a test of the whole cable up to one-half of the required breaking strain—that is, the entire length of cable, each of which measures 120 fathoms, must be subjected to a strain of 125,000 pounds in the case of the 2-inch. Eight lengths were called for, two each of the following diameters:  $1\frac{1}{2}$ ,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  and 2 inches. It was not certain that the requirements could be met, and but one bid for the work was re-

be obviated by the adoption of the side weld and should therefore add correspondingly to the strength of the chain.

The Chicago and Aurora Smelting and Refining Company, of Aurora, Ill., have put up a plant for electrolytically depositing copper. The other concerns working in this way are the Bridgeport Copper Company, at Bridgeport, Conn.; E. Balbach & Son, Newark, N. J.; the Chicago Copper Refining Company, Chicago, and the St. Louis Smelting and Refining Company, at St. Louis, Mo.

The accounts of the Foreign Mail Office for the transportation of mails have just been made up, to include the third quarter of the fiscal year. The increase in the quantity of mail exchanged between the United States and foreign countries is shown by the following comparison of the cost of the foreign mail service for the nine months ended March 31, 1888 and 1889:

	1888.	1889.
Transatlantic mails	\$247,744	\$265,593
Transpacific and miscellaneous	75,518	91,633
Panama Railroad	4,952	6,556
Closed mails	19,343	21,488

Total ..... \$347,557 \$385,260  
This shows an increase of 10.82-100 per cent. in the weight of the mails in 1889 over the corresponding period in 1888.

In a letter to the Collector of Customs at New York, dated April 15, 1889, the Treasury Department has held that razor blades without handles possess all the essential parts of razors, and are therefore dutiable at the rate provided for razors.



# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 96 and 97 Washington street, CHICAGO, April 27, 1889.

**Pig-Iron.**—Dealers report a quiet week, with the preponderance of business to the credit of out-of-town buyers. City consumers have their requirements well covered for the immediate future. A better feeling is noted among the local foundries, however, which is caused by an increase in work offering and in sight, but there will have to be a decided improvement in this direction to affect the Pig-Iron market appreciably. Yet sales have been made of Soft Southern Irons at a price which would not have been paid a fortnight since, which would seem to indicate a recovery from the extreme depth of the depression. On the other hand, furnace companies are deferring shipments on a very large part of the orders booked in February and March, their customers requesting this action on account of the falling off in their own business. Room exists, therefore, for a considerable increase in the consumption of Pig-Iron merely to catch up with the contracts already made. Under the circumstances prices of strong Coke Iron are barely holding their own, local brands being still available at rates with which outside Iron cannot compete. Lake Superior Charcoal Iron has been inactive, but large consumers are making inquiries on round lots, and prices will soon be tested. Cash quotations are as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16 @ \$16.50; No. 2, \$15 @ \$15.50; No. 3, \$14 @ \$14.50; Chicago and Bay View Scotch, \$16.50 @ \$17; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16 @ \$16.25; No. 2 Foundry and No. 1 Soft, \$15.50; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14.25 @ \$14.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

**Bar Iron.**—The monotony of the month was relieved this week by the appearance in the market of some manufacturing consumers, who seemed to realize that prices were about as low as could reasonably be expected. One concern placed an order for 1000 tons, largely for early delivery, and others bought fair quantities. Those buyers who were holding back to get the benefit of a reduced freight rate, which they presumed would, as in previous seasons, accompany the opening of navigation, seem to have been victims of false hopes, as the officials of the railroad concerned announce that they do not propose to reduce rates from Pittsburgh and Ohio points to Chicago. Manufacturers also who were quoting prices here for future delivery, based on the expected reduction, and thus depressed values below their normal point, will have to advance their rates if they wish to realize at mill what they expected to get. Small lots from mill are still quotable at 1.60¢ @ 1.65¢, f.o.b. Chicago, half extras, for Common Iron. Store prices are 1.80¢ @ 2¢, according to quantity and quality.

**Structural Iron.**—Mill lots of Universal Steel Plates are quoted at 2.15¢ @ 2.20¢; Angles at 2.10¢ @ 2.15¢; Tees at 2.50¢ @ 2.55¢, and Beams and Channels at 2.90¢, all f.o.b. Chicago, but a stiffening tendency is developing, owing to the improved condition of the Pittsburgh mills, which have received much business recently from other sections. Beams are in fair demand here, but other classes of structural material are dull. Small lots

from store are quoted at 2.25¢ @ 2.30¢ for Angles; 2.65¢ @ 2.70¢ for Tees, and 3.4¢ for Beams.

**Plates, Tubes, &c.**—Dealers agree in characterizing the past week as the dullest of the year thus far. City trade is absolutely lifeless. Yet prices are no lower, as the mills decline to make further concessions. Quotations from store are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 65 % off for 3-inch and over, 62½ % off for 2 to 2¼ inch, and 57½ % off for 1¼-inch and smaller.

**Sheet Iron.**—Manufacturers are steadily growing firmer in their views as their order-books fill up, and it looks now as though the quotation of 2.95¢, Chicago, for large lots of No. 27 Common would soon be advanced. Some are refusing to sell beyond July delivery, but others are not so chary of the future and have entered orders freely, covering the whole of the year. Small lots of Common from store are sold on the basis of 8.10¢ @ 3.20¢ for No. 27.

**Galvanized Iron.**—Manufacturers' agents and jobbers report a dull week. Prices are drooping, and, while quotations for small lots range from 65 % off on Juniata to 65 % and 2¼ % off on Charcoal, good buyers are having little trouble in securing more favorable terms. Manufacturers' agents insist that these low prices cannot continue long and that there must soon be a change for the better.

**Merchant Steel.**—The week has developed a renewed demand for cheap Steel, particularly from the manufacturers of agricultural implements, some of whom have taken advantage of the low prices now ruling to cover their requirements for the fall months. Higher grades are very quiet. Soft Steel Bars are quotable at 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢; Sheet Steel, 7¢, 8¢ and 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Steel Rails.**—A few small orders have been taken since our last report, but nothing of importance has transpired. Chicago quotations continue at \$30 @ \$30.50.

**Track Supplies.**—Only occasional sales of small quantities are being made. Steel Fishplates are quoted at 1.80¢ @ 1.90¢ and Iron at 5¢ @ 10¢ less; Bolts with Square Nuts bring 2.55¢ and Hexagon Nuts 2.65¢ @ 2.70¢; Spikes are quoted at 1.95¢ @ 2¢.

**Old Rails and Wheels.**—Old Rails, both Iron and Steel, are very quiet at present. For Iron Rails sellers ask \$20, but buyers offer only \$19, so that trade is at a standstill. Old Car-Wheels are still falling in price. Consumers would probably have to pay about \$17 for them, but dealers are not willing to pay over \$16. They are being pressed for sale by parties who have become tired of holding them.

**Scrap.**—The market is flat. Consumers are not buying Wrought even in small quantities, and it is being offered to dealers at very low rates. They are paying \$16 @ \$16.50 for No. 1 Railroad Shop, and proportionate prices for other grades. There is no inquiry for cheap grades of Iron Scrap, and Steel is also very quiet. Cast is in some demand for foundry use, and best quality is quoted at \$13.50 @ \$14 net ton.

**General Hardware.**—Business is in fair condition, but by no means as active as it has been. Some jobbing houses report a marked decrease in the sales of the last three days. May is usually a good

month, but the prospects are not bright for a very heavy trade in it this year. Some specialties are in very lively demand, however. Bicycles, for instance, are moving off very freely, the supply being unequal to the demand. All kinds of summer Sporting Goods are in almost equally active request, such as Tennis Sets, Baseball Outfits, Fishing Tackle, &c. Ice-Cream Freezers, Refrigerator and other Summer-House Furnishing Goods are also selling well, but in staples there is more or less complaint of dullness. The opening of Oklahoma, which occurred on the 22d, was a boon to the Missouri River jobbers, as they were able to work off a large part of their surplus stocks of Hardware in that direction. Prices are unchanged on most lines. Agricultural Wrenches have been put at 80 % and 5 % discount in case lots, f.o.b. Cleveland, with no freight allowance.

**Nails.**—A light business is in progress, and prices are a little weaker, though no actual change in quotations has been made. The classification of Wire Nails in kegs at a higher rate of freight, which was alluded to last week, is acknowledged by railroad authorities to have been an error which will soon be corrected. Small lots of Steel Nails sell at \$2, and Wire Nails at \$2.40, with 5¢ off for mixed carloads. The Calumet Iron and Steel Company's P. C. P. Nail is meeting with a very ready sale, notwithstanding the dullness of the general market.

**Barb Wire.**—Manufacturers are being pressed to make deliveries, and prices are more firmly held, but jobbers still quote small lots of Painted at 2.80¢ and Galvanized at 3.40¢.

The Joliet Steel Company and the Union Steel Company have removed their offices to the Rookery Building. They occupy a larger part of the tenth floor, to which the North Chicago Rolling Mill Company have also removed from their former location on the seventh floor. The offices of all these companies have been arranged in such correspondence with one another that as soon as the formal consolidation is effected on the 1st of May the business of the new Illinois Steel Company will go on smoothly and satisfactorily. A very large number of offices is required to accommodate the official staff and clerical force of this large corporation.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., April 29, 1889.

The fourth month of the year is about closing on a dull a period as any that the Iron trade has experienced during the recent depression. Prices are at the lowest, and sales extremely hard to make; yet in spite of this there is a feeling of confidence that is very remarkable. The idea is that while there may not be much change until after midsummer there must be a great improvement during the fall months, presuming, of course, that nothing of an unfavorable character occurs in the meantime. This feeling is so general that the present condition of things is accepted as a matter of course, and as a necessary preliminary to ultimate improvement.

**Pig-Iron.**—The market is no better than it was a week ago. Some think it is hardly as favorable as it was at that time. Prices are unchanged, however, and really good Irons are taken without much demur. Outside brands are irregular, and in forced sales may perhaps be a trifle lower, but as a rule there is a disposition to stand out for quoted rates, or pile up Iron until the demand improves. The recent reduction in coal will help local furnaces a little, but it ought not to

affect prices, as they are already much below what they should be to allow a reasonable margin for profit to producers. Still in the event of continued pressure to place Southern Irons in this market it will allow that much more of a rebate without placing the furnace companies in a worse position than they are already in. But the disposition is to look on the bright side, although at the moment there is no doubt that Southern competition is very severe. It is difficult to find out the exact status of Southern Iron as regards the amount sold and prices realized. Some consumers report very favorably as to its quality, others the reverse, but in both cases prices have been in accordance with quality. Hence if some brands of Southern Iron are sold at, say, \$14.50 delivered for Gray Forge or \$16.50 for No. 1 Foundry, it does not follow by any means that all Southern Iron sells at low prices, or that all Southern Iron is of inferior quality. As a rule, however, \$15 and \$17, delivered in consumers' yards, are prices which local Irons have to compete with, although in some instances \$17.50 is paid for certain brands. Local brands are quoted at from \$15 to \$15.50, delivered, for Gray Forge, \$16.50 @ \$17 for No. 2, and \$17.50 @ \$18.50 for No. 1. In some quarters stocks are increasing a little, but as a rule supply and demand are very evenly balanced. There is nothing in the immediate outlook to indicate any special change, so that it may still be called a waiting market.

**Blooms.**—The market is devoid of special feature, and transactions are nearly all of a routine character, and without change in prices. Sales chiefly at about the following figures: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 1/2 "Bloom" ton of 2464 lb.

**Muck Bars.**—Quiet but firm. Holders ask \$27, delivered, for good quality Bars, with buyers at \$26.50.

**Bar Iron.**—Business is dull and prices irregular. Some little attempt at firmness was made a few days ago, and sales were claimed to be at a half-tenth advance; but so many mills have been competing for business that it is doubtful if the increased rate has become general. It is stated, however, that a fair amount of orders has been accumulated for delivery during the incoming month, and that the undertone is stronger and liable to develop rapidly if the movement once gets fairly started. But at present there is nothing like activity, and it will require a good deal of business to give all the mills as large a share as they seem to want. The absence of demand for Skelp Iron is rather severely felt, so that, whatever may be in the future, the present, at all events, is anything but satisfactory to manufacturers. Prices are nominally from 1.75¢ to 1.85¢ for Best Refined Bars, but there is so much cutting in extras that actual prices are much below nominal quotations.

**Plate and Tank Material.**—As a rule reports from the Plate trade are a little better. Business is more plentiful, and some of the leading mills appear to have all the work they can handle during the coming month. This, with the regular day-to-day trade probably means enough to last until midsummer, even though there may not be in the meantime many more large orders. The outlook is encouraging nevertheless, as large consumers, such as ship and bridge builders, are very busy, and will require a great deal of stuff during the next six months. Prices have not stiffened to any extent yet, although manufacturers are talking that way, and would certainly ask more for deliveries later than May or June.

Prices nominally as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3 1/4¢; Fire-Box, 3 1/4¢ @ 3 1/2¢.

**Structural Iron.**—A fair amount of activity is reported in this department, and mills have all their capacity moderately well engaged for some time to come. There is unquestionably a great amount of work to be done in the near future, although there may be delays before it can be got under way. The outlook is on the whole considered favorable, although prices are low and margins narrow. Nominally quotations are about as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—Reports from this branch of the Iron trade are on the whole decidedly favorable. A great deal of business has been taken, while the continued inquiry from dealers and consumers indicates a good demand in the near future. Prices are steady, with some approach to firmness at about the following figures for carload lots:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, 1/4¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 1/4¢
Best Soft Steel, Nos. 21 to 24.....	3 1/2¢
Best Soft Steel, Nos. 25 to 26.....	3 3/4¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, 1/4¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67 1/4 %

**Steel Rails.**—The market is dull, although prices are held with some degree of firmness. Sales are chiefly in small lots at about \$28, at mill, and manufacturers claim that the order would have to be something very desirable to secure attention at less money. The demand for Steel in other forms is an important feature, so that, on the whole, mills are doing much better than would be supposed. Reports from other markets are to the effect that \$27, at mill, has been shaded for Rails, but they may refer to transactions made some time ago.

**Old Rails.**—There is very little demand at present, so that prices are nominal at about \$22 bid for spot T's, and \$23 asked. Latest transactions were at medium figures.

**Scrap Iron.**—The market is dull, but prices are nominally as before, viz.: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$23 @ \$24; Old Car-Wheels, \$17 @ \$18, Philadelphia.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Ave. |  
PITTSBURGH, April 29, 1889. |

There has been a considerably increased volume of business in Raw Iron this week. In regard to the near future of the Iron trade there is a diversity of opinion. Some well-informed operators look for business to improve as the season becomes more advanced, while others who look chiefly on the dark side see nothing very encouraging in the near future.

The wage scale will have to be renewed again on the 1st of July, and already the matter is being agitated. Mill owners, it is evident, will demand a reduction, and it will no doubt be resisted, but it is to be hoped that it will be adjudicated without a strike. Pittsburgh mill owners claim

they are paying entirely too much for puddling, &c., as compared with the wages paid east of here for the same kind of work, and that they are in justice and equity entitled to a reduction in the wage scale, but how the Amalgamated Association will view the matter it is difficult at this time to foretell.

The strike at the Rail mill of the Allegheny Bessemer Company still continues; it may be settled within the next 24 hours, and it may hold out for several weeks. Thus far the strike has been conducted on the part of the strikers in as orderly and law-abiding manner as could be expected; there has been but little or no violence, but a very strong pressure has been brought to bear on men who have been secured by the company and sent to the works with a view to starting up. It is thought that enough men will be secured to start up the mill on Monday next. The company have a number of contracts booked, but they are subject to the strike clause, and no great loss will be experienced thereby.

Freight rates on Iron have been reduced on the lines of the Pennsylvania Railroad Company from the Mahoning and Shenango valleys and Wheeling to Pittsburgh, from 80¢ to 65¢ per ton. This may be traceable in part, possibly, to the strong criticisms of Andrew Carnegie upon the policy of the Pennsylvania Railroad toward Pittsburgh, although the demand for the reduction in question, if we mistake not, was made before. This matter of transportation is of vital importance to our Pittsburgh manufacturers, as in these days of very close margins a freight rate frequently determines whether an order is to be placed here or elsewhere. It is not believed that the management of the great corporation in question intentionally discriminates against Pittsburgh, but our manufacturers generally aver that they have not received the treatment they are entitled to, in view of the immense business they give that company. The refusal of the company to give rebates is to be commended.

**Pig-Iron.**—There has been a considerably increased volume of business the past week, but at a reduction in prices. The reduction in freight rates has been to a considerable extent offset, so far as valley furnacemen are concerned, by the decline in price, and the consumer gets nearly all the advantage resulting therefrom. In other words, while the valley furnaceman gets a reduction of 15¢ in transportation, he has been compelled to knock 25¢ per ton off the price of his product in order to sell in this market. Sales of some 6000 tons Gray Forge at \$14, cash; 1500 tons do. at \$14.50, four months, and 1000 tons No. 1 Foundry at \$16.80, cash. The general feeling at present is that \$14, cash, is hard pan for standard brands of mill, but this time will determine. At all events, it is nearer hard pan if it has not not reached there. Bessemer, of which there were no sales reported, is quotable at \$16.25, cash. There appears to be more inquiry for Foundry Irons. Quotations may be fairly given as follows:

Neutral Gray Forge.....	14.00 @ .....	cash
All-Ore Mill.....	15.25 @ 15.75,	"
White and Mottled .....	13.00 @ 13.50,	"
No. 1 Foundry.....	16.50 @ 16.75,	"
No. 2 Foundry.....	15.50 @ 16.00,	"
No. 3 Foundry.....	14.75 @ 15.00,	"
No. 2 Charcoal Foundry.....	21.00 @ 22.00,	"
Cold Blast Charcoal.....	25.00 @ 28.00,	"
Bessemer Iron.....	16.25 @ .....	"

**Muck Bar.**—There has been more activity, but the market continues weak, in sympathy with Pig-Iron. Within the past week or two there has been a decline of 50¢ to 75¢ per ton. We can report sales of 1500 tons at \$26.25, cash; 2000 do. at \$26, cash, and 1000 do., at \$26, cash. It is claimed that there is not much profit in converting Pig-Iron into Muck Bar at \$12 per ton.

**Spiegel**—Is firmer, and is now quoted at \$30 @ \$30.50, cash, for 20 %. Ferro-manganese remains as last quoted—\$58 @ \$58.50 for 80 %.

**Manufactured Iron.**—The Merchant Iron trade continues light for the season, but there are hopes of an early improvement; not only is the demand light, but prices are unsettled and unremunerative. For strictly first-quality Iron prices may be quoted upon a basis of 1.60¢ to 1.70¢ for Bars, 60 days, 2% off for cash, but valley mills are offering Old Rail Iron as low as 1.40¢ @ 1.50¢. There is considerable inquiry for Skelp Iron, and some of the mills have all they can do. Grooved is quoted at 1.62½¢ @ 1.65¢ and 1.90¢ for Sheared.

**Nails.**—The Nail trade here continues very dull, and there does not appear to be much prospect of any immediate improvement. Prices are quoted at \$1.85 @ \$1.90 for 12d to 40d, 60 days, 2% off for cash. Wire Nails, for which there is a demand, are quoted in car lots at \$2.20, 60 days, 2% off. Manufacturers of the latter are making a strong effort to supplant the Cut Nail, and they are meeting with considerable success.

**Wrought-Iron Pipe.**—The Pipe mills are pretty fully employed, some of them having orders enough booked to keep their mills going most of the summer; as stated in our last report, the demand thus far has been chiefly for large-sized Pipe, but there will no doubt be an improved inquiry for the smaller sizes later on in the season. Combination prices are being faithfully adhered to. Discounts on Black Butt-Welded Pipe, 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Boiler Tubes, for 2 to 2½ inch, inclusive, 62½ % off; Casing, 5½-inch, 62½ % off; other sizes, 60 % off; 2-inch Tubing, 13¢ ¾ foot, net; 6-inch Line-Pipe, 53¢; 8-inch, 90¢.

**Old Rails.**—Old Iron Rails continue dull, and in the absence of sales may be quoted nominally at \$22.50, cash, at which last sale reported was made. The offerings are not large, but for the time there appears to be little or no inquiry. There is a good demand for Old Steel Rails, and prices are steady; 700 tons short lengths sold at \$17.25 and 200 tons long lengths at \$19.50. Until quite recently Old Iron Rails sold much more readily than Old Steels, but now it is different.

**Steel Rails.**—Heavy sections are still quoted at \$26 @ \$27, cash, at mill, according to size of order and delivery. The Edgar Thomson Works are running right along and pretty well up to their full capacity; but the mill at Duquesne, as noted elsewhere, is standing idle, owing to strike of employees.

**Blooms, Billets, &c.**—Bessemer Steel Billets and Blooms are quoted at \$27 @ \$27.50, cash, at makers' mill; do. Nail Slabs, \$26.50 @ \$27. Owing to the depressed condition of the Nail trade there is not much inquiry for Slabs, which, if we mistake not, are lower than ever before. Domestic Bloom and Crop Ends quoted, in absence of sales, at \$17.50 @ \$18. The last sale of the former reported was at \$18.

**Railway Track Supplies.**—No change in prices. Spikes, 2¢, 30 days, f.o.b. cars at works. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

**Old Material.**—The demand for all kinds of Old Material continues light, and there has scarcely been enough doing of late to establish prices, which we quote nominally as follows: No. 1 Wrought Scrap, \$19, net ton; No. 1 Wrought Turnings, \$18; Old Car Axles, \$24 @

\$25; Cast Scrap, \$14 @ \$15, gross ton; Cast Borings, \$11 @ \$12; Old Car-Wheels, nominal, \$19

## Louisville.

LOUISVILLE, Ky., April 27, 1889.

The market continues dull, and there has been little change during the past week. Several large transactions are on the point of being closed, provided furnaces will sell for deliveries desired. There is no change for the better, and prices remain low, with little prospect of a speedy advance. All grades appear quiet, and consumers are able to make purchases to meet their views with little trouble. The policy of consumers appears to be as fast as they make contracts to cover with purchases of Iron, so that when the real advance takes place they will be benefited by it. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, April 29, 1889.

**Pig Iron.**—The condition of the market and the movements of Iron are practically unchanged since the last report; there seems to be a market for all the Iron that is being turned out, as there is but little being stacked at such furnaces as are disposed to take the market rates for their output, which is the case with most of them. The demand seems to come from all quarters of the United States, from single carloads up to 100 and 500 ton lots, and most orders are for quick shipments. There are some sales being made for large round lots, but it appears to be generally understood that these are for speculative purposes, as some of these purchases are being filled up at the furnace yards. We note sales of 1000 tons No. 2, a favorite brand at \$12, cash, at furnace yard, to be so disposed of, and learn that quite a number of other lots are being so placed. Upon the whole there appears to be but little animation manifested in any of the Pig-Iron producing centers, but rather a waiting for something to turn up. In the meantime it appears to be generally conceded that prices will not at present advance, and it is quite certain that they cannot well go lower.

## Cleveland.

CLEVELAND, April 27, 1889.

**Iron Ore.**—Nearly all the mining companies have made fair sales during the past week, the aggregate amount of ore sold since the last report probably aggregating 300,000 tons. Buyers are asking for Gogebic Bessemer this week and several large blocks will be sold within the next few days at an average price of about \$5.25 ¾ ton. Considerable Ore from the Chapin Mine has been sold to furnacemen along the Lehigh Valley Road at prices varying from \$5.10 to \$5.25, f.o.b. vessels Buffalo. Ores from the Champion and Republic mines are still bringing \$5.75 readily and Minnesota Ores are in good demand at the same figures. Nearly 80,000 tons of new Ore have been unloaded at Cleveland, Ashtabula and Fairport

during the past week. The Ore men are having no difficulty in engaging tonnage at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland and Two Harbors.

**Pig-Iron.**—There is a little more inquiry than was noticeable a week ago, but the prices realized for the small lots reported sold are too vacillating and indefinite to base reliable quotations upon. An improvement is expected whenever these scattering sales, grouped together, cause a scarcity. Furnace agents do not seem to be attempting to force business, contenting themselves with waiting a week or two longer for the hoped-for change in the situation. Foundry Irons are more affected by the present depression than are the better brands of Gray Forge, for which a light though continued inquiry is reported.

**Manufactured Iron.**—The demand is not heavy, and Bars are quoted at 1.60¢ @ 1.70¢, 60 days, 2% off for cash, for carload lots from mill. Sheets are firmer.

**Odd Rails.**—The market is far from active. A surplus of Old Wheels is reported, and Old American Rails do not command over \$21.50.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, April 29, 1889.

**Pig-Iron.**—Business in Pig-Iron here during the week under review has been dull, yet there has been a number of small orders for carload and 50-ton lots, which in the aggregate make a not unfavorable showing. A few 1000-ton lots are also reported by a few agents and dealers, among them being 1000 tons Gray Forge Iron on a basis of \$18, cash, here. The regular price for No. 1 Southern Foundry Iron is \$14.75 @ \$15, with the outside rates an extreme, and only small sales at these rates. No. 2 Southern Foundry has been offered at \$14.25 @ \$14.50, the outside rate for small amounts. A special sale for June, July and August delivery has been made during the week consisting of 2000 tons No. 1 Foundry, at \$15.40, and 2000 tons No. 2 do., at \$14.40, on time. Mottled Iron has continued heavy and depressed, and Car-Wheel grades have remained neglected. The following are the approximate prices current here at the close, for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.00 @ 14.50
Southern Coke, No. 3 (new classification).....	13.50 @ 14.00
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

Forge.	
Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	12.00 @ 12.50
Gray Forge.....	13.00 @

Car-Wheel and Malleable Irons.	
Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

**Manufactured Iron.**—There is no improvement in the demand for Manufactured Bar or Structural Iron and an easy tone has continued to prevail, but prices are without quotable change.

**Nails.**—The market has been a little irregular in tone and the demand has been only moderate. 12d @ 40d sell at \$1.90 @ \$1.95 ¾ keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.45 @ \$2.50 ¾ keg.

**Old Material.**—The demand has been light and a weaker tone has prevailed, but there has been no pressure to sell. Old

Rails have remained dull, but it is difficult to obtain desirable lots under \$20, cash. Buyers of Old Wheels have reduced their limits to \$17.50, but there are few sellers under \$18, spot cash.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York. April 29, 1889.

**American Pig.**—The only feature of any interest during the week under review has been the report that Southern Iron has been offered both at Boston and in this market at \$16 for No. 1. The quotation in the New England market is particularly low, since the cost of delivery to that point is nearly \$1 higher than it is to New York from the Southern furnaces. It should be stated, however, in connection with these low offerings that they emanate exclusively from new companies, who are introducing their Iron and naturally find it necessary to make concessions. While the quantity that is offering is naturally small, and the pressure to sell can only be temporary, it is nevertheless having its effect upon the market, which is weaker. We continue to quote Northern standard brands \$17.50 @ \$18 for No. 1, \$16.25 @ \$17 for No. 2, and \$15 @ \$15.25 for Gray Forge. The latter is difficult to sell, and if wanted could be bought at \$14.50, at tidewater.

**Spiegeleisen and Ferromanganese.**—No transactions of any consequence are reported, but the offerings of a number of large blocks have caused a weakening to \$27.25 as sellers' figure, which buyers do not approach. We quote, Ferromanganese \$56 @ \$56.50, ex-ship.

**Structural Iron and Steel.**—We continue to quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

**Bar Iron.**—For large lots, Common is being offered at 1.55¢, delivered. The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Steel Rails.**—Pittsburgh has again become a storm center, a recent large sale in that market having been made at \$26, if reports generally current are to be credited. An additional feature causing weakness is the offering by brokers of two 10,000-ton lots, bought on speculation from a new mill. The only sales reported during the week have been 2500 tons by an Eastern mill at private terms, and about 2000 tons, Anniston delivery, by a Pittsburgh mill. There are a few large Southern orders still in the market, but in the case of at least one of them the financial standing of the purchasers and the conditions offered are not such as to induce much rivalry for the business. The vigorous competition between the Pittsburgh mills has created a good deal of uneasiness, and it is reported that the rail-makers will soon hold another meeting to discuss the situation. In the meantime, the market is unsettled, with \$27 @ \$27.50 the usual quotation. The lower figure, however, might, under exceptional circumstances, be shaded.

**Old Rails.**—The market is dull, the quotations remaining nominally \$22.50 @ \$23.

**Rail Fastenings.**—Some of the recent contracts taken for Rail Fastenings have been at exceptionally low figures; thus \$1.70 has been made for Angles, delivery at Toledo, the seller being a Western mill,

while an Eastern mill has named \$1.60, delivery at Boston. Spikes continue demoralized at \$1.90 @ \$2.

Messrs. Witherbee, Sherman & Co. have moved their offices to the Bank of America Building, Wall street.

The American Pig Iron Storage Warrant Company occupy new offices on the fourth floor of the Bank of America Building, Wall street.

The Joliet Steel Company, A. T. Shoemaker, agent, has removed to the Bank of America Building, Wall street.

## Financial.

Yielding to the pressure of an all-pervading national sentiment, the volume of business for the current week is necessarily curtailed, and the record of transactions, for the same reason, is partial and fragmentary. The report that the Senate and Assembly had concurred in a resolution to make Monday and Wednesday of this week legal holidays was received with much satisfaction by most of the members of the several exchanges, and generally in other commercial circles. The feeling seemed to prevail that the Governor would sign the bill, thus creating an unbroken succession of legal holidays from Saturday at noon to Thursday at 10 o'clock in the forenoon. Some inconvenience is likely to arise, but no serious trouble. The Canal Commissioners give notice that the Erie Canal will open in its entire course May 4, and from Buffalo to Utica May 1. All along the line of the lakes and canals the season will open remarkably early. Some uneasiness exists in commercial circles, arising from an effort to induce Secretary Windom to abandon the proposed site for the appraiser's stores in this city. The monthly report of the Bureau of Statistics was favorable far beyond expectations, showing the exports of merchandise for March to have been \$69,114,358, which is nearly \$19,000,000 more than they were for March, 1888, and considerably more than they have been during any March since the present tariff act has been in operation. The imports for March also show a gain, being \$66,281,032, or \$3,000,000 more than they were in March, 1888, and also more than they have heretofore been in March of any year since 1888. While few ventured to predict that the exports for the month would equal the imports, an excess of more than \$7,500,000 in the balance of trade was wholly unlooked for, and this against an adverse balance of \$11,000,000 a year ago. For nine months the favorable balance is \$62,452,863, and this gratifying feature in the financial situation is well calculated to add zest to the centennial ovation.

The Stock Exchange markets were without notable feature until Thursday, when the brisk demand, both for stocks and bonds, influenced very considerably by higher prices in London, together with a plethora of money and improved foreign trade reports, occasioned a sharp advance. The chief interest centered in the bond market. There were occasional slight reactions due to realizations and bearish pressure, but the recoveries were prompt, and the market was strong at the close. There was more or less realizing on Friday, but the tone was strong on Saturday, and comparisons show a general gain in prices for the week.

United States bonds are quoted as follows:

U. S. 4½, 1891, registered.....	108½
U. S. 4½, 1891, coupon.....	108½
U. S. 4, 1897, registered.....	123½
U. S. 4, 1897, coupon.....	123½
U. S. currency.....	121

The bank return for the week shows an increase of \$1,340,300 in surplus reserve, which now stands at \$13,426,950. The

loans are contracted \$982,900; the specie is decreased \$849,800; the legal tenders are up \$2,201,800; the deposits other than United States are increased \$46,800.

The exports of specie were for the week \$1,794,000, and the imports \$167,000. The imports of merchandise were valued at \$9,574,000, of which \$2,000,000 represents dry goods.

The money market was easy, time money being available at low rates in amounts in excess of the demand. For three to four months the quotations were 2½ @ 3%, and for longer periods 3 @ 3½%. Commercial paper was in good demand, with small offerings.

The market for sterling was dull and a shade easier. There was an increased supply of security bills. Posted rates closed at \$4.88 @ \$4.90.

The general markets were unusually quiet, aside from fluctuations of a speculative character. Sugar again advanced, granulated now selling at 8½¢ @ 9¢ lb, as compared with 7¢ in March, when the advance commenced. Sugars for which the refiners now charge 8½¢ cost them in the raw state 7½¢. Formerly 8¢ was the average margin between the market price of raw and refined sugar. Cotton is stronger, but wheat, flour, provisions and some other commodities betray weakness. Among dry-goods jobbers there is an expectation of more business after the holidays. New York prices of wheat on Saturday were 83½¢ for May, 84½¢ for June, 86¢ for July and 89½¢ for December, as against a week ago of 84½¢ for May, 85¢ for June, 86½¢ for July and 89½¢ for December.

## Metal Market.

**Copper.**—Since our last weekly report spot Copper advanced in the London market from £36. 17/ to £38. 5/, and futures from £37 to £38. 5/, at which it wound up strong yesterday, sales aggregating 1375 tons. Intimations were privately cabled from the other side, it appears, that negotiations between the representatives of mines and the parties interested over there are proceeding more smoothly, so that ere long an understanding may be reached. This may perhaps explain the greater buoyancy in London, or the latter may simply be due to the covering of bears. Paris, meanwhile, cabled April 27: "The report of the receivers of the Comptoir d'Escompte says that by prudent realizations the assets of the concern will probably yield a surplus of 6,000,000 francs. The report also indicates the manner in which shareholders may enforce their claims on the personal estate of the late M. Denferi-Rochereau. The new Comptoir d'Escompte will begin operations on May 1." Nothing in the way of actual business meanwhile transpired in our market. For Lake 14½¢ is offered and 15½¢ asked. We understand that some of the leading interests are advocating the fixing of the price between 12¢ and 13¢, with the probability that the former will be adopted.

**Tin.**—Tin has been on the downward track again in London, giving way since we last reported from £92. 10/, spot, to £91. 5/ and futures from £98. 2/6 to £92. 2/6 yesterday, sales summing up 460 tons in the meantime. Here greater activity developed, 10 tons spot being sold at 20.65¢; 20 tons May at 20.50¢; 10 tons June at 20.60¢; 10 tons July at 20.60¢; 10 tons August at 20.65¢, and 10 tons September and 10 tons October, also at the latter figure; subsequently the downward course of the London market unsettled ours, spot being easy at 20½¢; July at 20.40¢, and 10 tons October being parted with at 20.55¢. The market closes in New York at 20½¢, spot, at the Metal Exchange; 25 tons prompt shipment brought 20.40¢. **Tin-Plates.**—There is no change here, and the



market is very dull. There are indications of weakness in the foreign markets in everything in the Tin-Plate line except Ternes. We quote, large lines, ordinary brands, 3 box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.75; Ternes, \$4.12 @ \$4.30; Coke Tins, \$4.30 @ \$4.40, and Wasters \$4.15 @ \$4.20.

**Lead.**—Our market is very demoralized, with sales of 100 tons Common Domestic to consumers at 8½¢, and rumors of sales at 8.60¢. The Western markets are extremely flat at 8.40¢.

**Spelter.**—The volume of dealings in Common Domestic has been reduced by an absence of active demand, and the little done has been at 4.65¢, while Silesian has advanced to 5¼¢, below which none can be had.

**Antimony.**—A moderate jobbing trade has been proceeding at 12¢ Hallett and 13¼¢ Cookson.

### New York Metal Exchange.

The following sales are reported:

THURSDAY, April 25.	
10 tons Tin, spot.....	20.65¢
10 tons Tin, June.....	20.60¢
10 tons Tin, July.....	20.60¢
10 tons Tin, August.....	20.65¢
10 tons Tin, September.....	20.65¢
10 tons Tin, October.....	20.65¢
10 tons Tin, May.....	20.50¢
FRIDAY, April 26.	
28,000 lb G. M. Copper, spot.....	12.00¢
48 tons Lead, May, first half.....	3.62½¢
10 tons Tin October.....	20.55¢
SATURDAY, April 27.	
25 tons Tin, prompt shipment.....	20.40¢

### Coal Market.

The Coal trade is without new feature, dullness being the general complaint. Quotations for Anthracite Free-Burning, f.o.b., are: Broken, \$3.75; Egg, \$3.90; Stove, \$4.15; Chestnut, \$4. Reading Hard White Ash prices are the same excepting Broken, which is \$3.90, and Egg, \$4. Pea is \$2.30 @ \$2.40; Lump and Steamboat, \$4.25. Individuals cut these figures materially. The Reading Railroad has reduced the prices for furnace sizes of Anthracite 25¢ per ton, making the new price \$1.85 per ton at the mines. The tolls to furnaces along the Schuylkill Valley have also been reduced an average of 8¢ per ton, according to the distance of the furnaces from the mines. These reductions in prices and tolls took effect at once. A new coal yard, with a storage capacity of 1,000,000 tons, is to be built at Mahanoy City by the Reading Railroad Company. The contract for supplying the Hoboken Ferry Company with 2000 tons has gone to the Pocahontas region at prices said to be somewhat below those of the Seaboard Association, whose figure is \$3.50.

Although the official figures are suppressed, the stock of coal at tidewater April 1 is commonly understood to have been about 897,000 tons, an increase of 60,000 during March.

Daniel S. Lamont, ex-President Cleveland's former private secretary, and ex-Senator Thomas C. Platt have been elected directors in the Tennessee Coal and Railroad Company.

The Detroit Gas Company, of Detroit, Mich., on Saturday, at Pittsburgh, contracted for 16,000 tons coal. The Youghiogheny and Ashtabula Coal and Coke Company received the contract for 8000 tons, and Osborn, Sager & Co. received a contract for a like quantity. The rate is \$2.16 per ton, f.o.b., in Detroit.

The Lackawanna Coal and Iron Company, Scranton, Pa., are adding a new converter to their plant.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, MONDAY, April 29, 1889.

Merchant Bar Copper declined to as low as £38. 10/ last week, owing to various unfavorable rumors, but subsequently reacted to £38. 12/6, under the influence of reports of partial success of efforts made to form a new combination, together with a sharp rise in prices of mining shares. Today the price is about £37. 5/ @ £37. 10/, but speculation is without spirit and consumers are still purchasing cautiously. Large holders have continued to realize when favorable opportunities offered for doing the same without depressing prices.

The Tharsis Company have declared a dividend of 25 %, the "syndicate" having settled for all Copper delivered, leaving as the loss to the company the margin between contract price and open market rates. It is stated the losses of the Société des Métaux amount to 121,000,000 francs, omitting those that will probably result from non-execution of contracts and consequent settlements of difference between contract and market prices.

Block Tin has weakened again, prompts selling at as low as £91 and futures at £92, although the pressure of supplies has been moderate. The Batavia sale of Billiton last week realized an average of £93 in Holland.

Speculation in Pig-Iron Warrants has been more animated, particularly for the account of outsiders, but prices have eased off to 44/ under per cent. selling by holders. Makers' brands of Scotch show but slight variation in price and continue to sell briskly. Middlesborough Pig has been in active demand for forward delivery, and a further increase in the output is being arranged for, with precautions taken not to extend the production so as to unfavorably affect prices. Hematites are noticeably strong and have been sold this week at 6d. advance.

There has been an active demand for special sorts of Tin-Plate, and the general demand has averaged good also, giving prices decided firmness. There are rumors of two South Wales works being in difficulty. The proposed "syndicate" propositions are being discussed, but further than this, have not progressed.

In nearly all branches of the Manufactured Iron and the Steel trades, there continues to be an active business, and prices are very firm throughout.

**Scotch Pig.**—A fairly active business, with but little change from last week's prices.

No. 1 Coltness, f.o.b. Glasgow.....	55/
No. 1 Summerlee, " ".....	54/6
No. 1 Gartsherrie, " ".....	52/6
No. 1 Langloan, " ".....	55/
No. 1 Carnbroe, " ".....	47/6
No. 1 Shotts, " at Leith.....	53/6
No. 1 Glegarnock, " Ardrossan.....	52/
No. 1 Dalmeilington, " ".....	46/
No. 1 Eglinton, " ".....	45/
Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.	

**Cleveland Pig.**—The market not so strong, but demand good, particularly for futures. No. 3 Middlesborough, G.M.B., 38/6 prompt, and 39/ future.

**Bessemer Pig.**—A large business passing and the market strong. West Coast brands, mixed numbers, 50/, f.o.b. shipping point.

**Spiegeleisen.**—Prices firmly held, and the demand fair. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

**Steel Rails.**—Demand continues brisk and prices are strong. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—Sellers very firm, but the demand only fair. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—The market strong and demand fairly active. Bessemer, 2½ x 2½ inch, £4.10/, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Moderate sales making, but prices very firm. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—No change in this line; the demand slow. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap Iron.**—Market very quiet; no change in sellers' prices. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—Demands still moderate, but prices firm. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin Plate.**—Demand has been fairly active, and prices are firmly held. We quote, f.o.b. Liverpool:

1C Charcoal, Allaway grade.....	15/3 @ 15/9
1C Bessemer Steel, Coke finish.....	13/6 @ 14/
1C Siemens " ".....	14/ @ 14/6
1C Coke, B. V. grade.....	13/ @ 13/3
Charcoal Terne, Dean grade.....	12/ @ 12/6

**Manufactured Iron.**—There continues to be a good trade, and prices are very firm. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Ord. Marked Bars.....	@ 8 2 6	@ 8 2 6
Common " ".....	@ 5 17 0	@ 5 17 0
Staff. Bl'k Sheet, singles.....	@ 7 15 0	@ 7 15 0
Welsh Bars (f.o.b. Wales).....	5 2 6 @ 5 5 0	5 2 6 @ 5 5 0

**Copper.**—Less business doing for consumption. Speculation fairly active. Today's prices for Bars were £37. 5/ @ £37. 10/, spot; £37. 10/, three months' futures. Best Selected, £45.

**Tin.**—The demand slow, and prices rather weak. Straits sold at £91, spot, and £92 for three months' futures.

**Lead.**—A fair business doing, and prices steady. Quoted £12. 15/ for Soft Spanish.

**Spelter.**—No material change in prices. The demand fair. Quoted at £17. 12/6 @ £17. 15/ for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.8
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Wlreia (Portugal).....	\$1.08
Wlreia (Brazil).....	51.6
Mark (Germany).....	28.5
Allogram.....	2.205
Picul.....	184.

### BRAZIL.

PARA, April 23, 1889.—**India Rubber.**—The steamer Finance has just left for New York with 70 tons of Rubber on board, leaving no stock in first hands and only 70 tons in second hands. A cablegram from London, dated today, announces the sale there of 180 tons fine Para at 31½¢ per lb, and that still higher prices are asked for the unsold remainder.—Per cable direct.

### CHILI.

VALPARAISO, March 1, 1889.—**Copper.**—Not a ton of Copper has been sold during the fortnight, and it is nominal, owing to the unsettled condition of the London market. Coal is held with increased firmness; Newcastle at 30/, and Australian at 30½/. Exchange.—90 days' sight on London, 29½¢.—Weber & Co.

## EAST INDIES.

**MANILA**, April 22, 1889.—*Hemp*.—There are buyers at \$12.50, against \$8.25 same date last year, equaling  $\frac{1}{2}$  ton, cost and freight, £42. 17/6, against £28. 15/6. No clearances are reported for the United States since last cable, against 14,000 bales in 1888. Since January 1, 105,000 bales, against 57,000; loading for ditto, 11,000, against 16,000; cleared for England since January 1, 87,000 bales, against 107,000; loading for ditto, 8,000, against 14,000; cleared for all other ports, 12,000, against 25,000; receipts at all ports since last cable, 11,000, against 8,000, and since January 1, 211,000 bales, against 184,000 in 1888 and 139,000 in 1887. *Freight*, \$7.50, against \$5. *Exchange*, six months' sight, 3/7, against 3/8 $\frac{1}{2}$ .—*Ker & Co.*, per cable to their agent in New York. *Mr. Charles Nordhaus*, 89 Water street.

**COLOMBO**, Ceylon, March 14, 1889.—*Plumbago*.—Dealings for export have been restricted for the week to small parcels at ensuing quotations in rupees  $\frac{1}{2}$  ton: Large Lumps, 145 @ 170; Ordinary Lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Amounts exported to date since October 1 have been as follows: To England, 54,901 cwt.; to Hamburg, 5418; to Antwerp, 5101; to Bremen, 659; to Holland, 437; to India, 63; to Australia, 88; and to the United States, 63,727; together 130,394 cwt., against 114,527 in 1888, 102,712 in 1887, and 81,641 in 1886. *Exchange*, six months' sight, 1/4 27-32.—*Volkart Bros.* to their agent, *Mr. John W. Greene*, 82 Wall street.

## SOUTH AFRICA.

**PRETORIA**, Transvaal, March 21, 1889.—*Silver*.—Rich Silver ores have been discovered in our immediate vicinity on the Middleburg-Barberton road, and several mining companies have been started here and in Johannesburg. Shares are to be placed in the European markets.—*Argus*.

## RUSSIA.

**ODESSA**, April 15, 1889.—*Petroleum*.—The formation of a company is planned at Baku for the purpose of pushing the export of Naphtha and Petroleum to Chinese, Japanese and Siberian ports. *Entrepôts* of refined Petroleum are to be created well furnished with lamps suitable for its use at Vladivostok and Petropavlosk, whence it is to be shipped to branch establishments in China, Japan and East Siberia. Shipments of Russian Petroleum in tank steamers to England reached the equivalent of 143,474 barrels since January 1, as compared with 36,259 last year. During the same period last year the United States have shipped to England 181,449 barrels, and this year 168,867 barrels.—*Commercial Gazette*.

## SPAIN

**BILBAO**, April 6, 1889.—*Iron Ore*.—The bad weather has checked activity in Ore dealings on the spot, the comparatively little done being at 7/ @ 7/4 Rubios and 8/4 @ 8/8 Campanil, the latter still tending upward, owing to its growing scarcity. There are steamers in port of a joint capacity of 80,000 tons chartered to load Ore. Freight is drooping still further. The total export of Ore hence to date aggregates 1,061,654 tons, against 1,024,858 tons same time last year. *Pig-Iron*.—There were shipped during the week 3193 tons abroad and 1117 coastwise. The spot quotation of the Vizcaya Company's Pig-Iron is 60 @ 65 francs  $\frac{1}{2}$  ton, f.o.b., to arrive (deliverable at any time in 1889), 58 @ 62.50, analysis guaranteed. During the first quarter the Altos Hornos Company exported 3027 tons of Pig-Iron; the Mudea, 4618, and the Vizcaya, 13,565; together, 21,210 tons, against 17,268 in 1888.—*Bilbao Marítimo y Comercial*.

## GERMANY.

**HAMBURG**, April 20, 1889.—*Iron*.—The Rhenish Westphalian Pig-Iron market has continued active, but the latter less so for export. Americans were ready to take large lines for forward delivery, but makers were not disposed to sell so long ahead at ruling rates. Now this demand revives on a large scale, but if Americans want any they will have to submit to an advance should the English market continue firm. The present price on the spot remains 63. An advance of 2 marks  $\frac{1}{2}$  ton is asked for deliveries of Forge Pig during the last quarter of the year; the present figure is 55 to 57. English Bessemer on the West Coast commands 49, an improvement of 1/. Finished Iron for home use is doing well, but not for export. The most active articles are Beams, for which the demand increases daily, and Boiler Plates. The advance of \$1 in Wire Rods in America causes a better feeling therein. There is no change in other products in the Iron and Steel branches.—*Borsenhalle*.

The sales of bunting in New York for decorative purposes during the past week have been enormous. According to one estimate the expenditure on this account will amount to \$1,500,000.

## Wages in 1800.

The following extract from "McMaster's History," showing the condition of the working classes nearly a century ago and the rate of wages then prevailing, will be found of more than usual interest to mechanics of the present day:

The condition of the wage class of that day, 1800 (A. D.), may be well examined. It is full of instruction for social agitators. In the great cities unskilled workmen were hired by the day, bought their own food, and found their own lodgings. But in the country, on the farms, or wherever a hand was employed on some public work, they were fed and lodged by the employer and given a few dollars a month. On the Pennsylvania canals the diggers ate the coarsest diet, were housed in the rudest sheds, and paid \$6 a month from May to November and \$5 a month from November to May. Hod-carriers and mortar-mixers, diggers and choppers who, from 1793 to 1800, labored on the public buildings and cut the streets and avenues of Washington City, received \$70 a year, or, if they wished, \$60 for all the work they could perform from March 1 to December 20.

The hours of work were invariably from sunrise to sunset. Wages at Albany and New York were 3 shillings, or, as money then went, 40 cents a day; at Lancaster, \$8 to \$10 a month; elsewhere in Pennsylvania workmen were content with \$6 in summer and \$5 in winter. At Baltimore men were glad to be hired at 18 pence a day. None by the month asked more than \$6. At Fredericksburg the price for labor was from \$5 to \$7. In Virginia white men employed by the year were given £16 currency; slaves when hired were clothed and their masters paid £1 a month. A pound, Virginia money, was, in Federal money, \$3.33. The average rate of wages the land over was \$65 a year, with food and perhaps lodging. Out of this small sum the workman must, with his wife's help, maintain his family.

## Hardware in England.

From discussions which are carried on in the English trade journals it is evident that Hardwaremen are to a greater or less extent embarrassed by the competition of co-operative stores and merchants in other lines who offer to their customers a variety of goods which have been regarded as legitimately belonging to Hardwaremen. The London *Ironmonger*, in a recent issue, contains answers to inquiries as to the extent to which ironmongers are affected by the competition of the London or local co-operative stores or by competition of drapers, tea shops, &c., and as to the best and surest way of successfully meeting the competition and cutting of the stores, drapers, tea shops, &c. From these replies we make the following extracts, which, aside from their bearing on the question under discussion, will be of interest as reflecting more or less fully the conditions under which English Hardwaremen are carrying on their business:

In the first place, buy and sell as much as possible for cash; encourage ready-money sales by allowing 5 per cent. on all transactions above, say, 10 shillings; sell all leading articles very cheap, and ticket them up in your shop and windows; keep windows clean and tidy and make them attractive—50 per cent. of the ironmongers' shop windows are a disgrace to the trade; fill a whole window occasionally with special or seasonable goods—at present there should be a good display of Garden Tools and Implements. In the second place, see that you give no employment whatever to any one connected with a co-operative store, as they only make use of you to suit their own ends, but employ those only who believe in individual enterprise—they, being your own customers, are entitled to the first claim upon you; speak and write very plainly to manufacturers; let them understand that you will not

ers on this subject, and ask them to do all in their power to discourage this movement, which has now become so great a hindrance to buy goods which you know to be made almost wholly by co-operators. Many manufacturing districts which could be easily named are now almost wholly given up to co-operation, and some towns are now completely ruined for business. If this leveling-down system is allowed to go on at the same rate that it has been doing for some time past very soon there will be little use for either manufacturer or merchant. Individual effort against this and other injustices to the trade is very good so far as it goes, but without united action little can be done. Almost every trade has got its association for self-protection. Why not the ironmongers?

If capital is available, make a big show and go in for novelties; but this must not be done unless with a firm determination to carry it through, and get a name for cheapness whether you are cheap or not. How this is done I have not yet found out.

Do your business on the same lines as stores, &c. I always endeavor to impress on customers who I know deal at stores that any article can be supplied at the same rates and price for cash, and never let it be thought for one moment that you can be beaten in fair competition.

If it were only a question of prices it might be met; but the prejudices of the people are to be overcome. One way is persistent advertising and comparing store prices with that of your own. Another is to have nothing to do with those houses that supply the stores, as in three cases out of four it is not done fairly. I also think there should be more interchange of opinions in conversation among ironmongers themselves on the matter.

The mischief has become chronic and will be difficult to alter now. The trade guilds of centuries ago would come in useful now if revived. Other agencies are also working fatal mischief to the ironmonger. Thus, wholesale houses are open to receive orders from architects, agents of estates and private individuals, and quoting discount at almost the same rate as to the ironmonger, so that the latter has to compete directly with the producer, and must give up the greater part of his discount or lose the order.

## Labor in the New York Prisons.

Machinery will again be employed in the State's prisons of this State if the Fassett bill becomes a law, of which there now seems to be a strong probability. Only by a very close vote in the Assembly was the State saved from the burden of taxation and demoralization of convict labor entailed by the Yates bill, which it was proposed to re-enact with some ameliorating features, but which really afforded no adequate relief. The Fassett bill provides for three grades of prisoners. The last grade is to be composed of incompetents and incorrigibles. An amendment was carried, 69 to 41, preventing the employment of third-grade men on machines of any kind, the object being to make scavengers and general utility men of those who will not work. The question of abolishing machinery altogether was decided in the negative by a vote of 66 to 43, thus permitting the restoration of machinery, with which the prisons have been equipped at a considerable cost. To some extent, however, the bill is emasculated and rendered nugatory by the adoption of an amendment offered by the opponents of the Fassett bill as a sort of compromise, as follows: "The total number of prisoners employed at any one time in manufacturing one kind of goods which are manufactured elsewhere in the State shall not exceed 100 in number in all of the State's prisons, penitentiaries and penal institutions in the State, and shall not exceed 10 per centum of the number of all persons within the State employed in manufacturing the same kind of goods, as shown by the last United States census or state enumeration, except in industries in which there are employed not to exceed fifty free laborers." As finally passed in the Assembly last Monday, the bill appropriation was cut down to \$500,000. In this shape there were but 20 negative votes.

# Hardware.

We continue below the careful review of business throughout the country, as per detailed advices received from representative wholesale and retail merchants in the different States:

## District of Columbia.

Our advices are to the effect that business in general is good, and the outlook is certainly as good as last year's, and probably better. Competition has kept prices down to a very low margin of profit, and in this respect matters are not improving. The distrust on the part of the trade as to stability of prices has not, however, prevented them from purchasing a sufficient quantity of goods to keep their stocks well assorted, and they appear to be a little larger than usual. Building promises to be active. Collections are a little slow, but there is probably little ground for complaint.

## Delaware.

Trade during the season has been uneventful and not altogether satisfactory as to volume, and at present Hardware is dull. The low prices of produce have a depressing effect. Collections are sluggish.

## Virginia.

General business shows an improvement over last year, and in many points is reported as quite active, though in some complaint is made of dullness. The Hardware trade was rather late in opening this spring, but business in the main has been satisfactory, and the trade are still fairly busy filling orders. Full stocks are in many cases carried, but the margins at which goods are sold are referred to as close. A cheerful tone characterizes the reports from this State, and the prospects are generally referred to as bright, there being a good deal of building in anticipation, a number of towns showing evidences of enterprise and progress. The short crops for the past few years and low prices for agricultural products the past year have operated against business, but the outlook now for the present season seems favorable and farmers report their growing crops as promising. Collections are good, and merchants are rather more conservative than usual in crediting goods to their country customers, and a larger proportion than usual of cash sales are made. There is not likely to be much improvement in this regard or in the volume of business until the crops are marketed. The development of manufacturing and the erection of factories in a number of places indicate well for future business.

## West Virginia.

During the past few weeks business in general has been very fair, but before that was rather slow, owing largely to the condition of the roads, and trade was usually disappointing. Hardware has sympathized with these general conditions and dragged during January and February, but has been quite active since March 1, and careful estimates point to the conclusion that sales for the first quarter of this year will just about equal those for the same time in 1888. It is to be noted that stocks are generally light, as buyers have not been anticipating their wants as freely as usual, and there has been a great deal of pick-up buying. The impression that prices are low and uncertain has tended to induce this, there being little confidence that the bottom has yet been reached. The reports in regard to the amount of building under way or contemplated vary according to the locality, but their general tenor is that there will be more activity in this direction than for some time, and cheap houses especially are likely to preponderate. The

agricultural conditions are good, crops for the last year or two having been fair and those for the present year looking well. Collections throughout the country regions are slow and hard, but in towns usually easy and prompt. There is increased railroad-building and development of the interior of the State, which is affecting business favorably.

## North Carolina.

Reports in regard to general business indicate that it is fair and that in Hardware a satisfactory condition of things exists, the demand having been good for the past few months. Trade will probably be light until the early fall, when it is expected that a large business will be done. Stocks of Hardware are full too large, but have been diminished somewhat since January 1. Reports from a number of places indicate considerable building at present and in prospect. Collections are very fair. Prices are referred to as low and demoralized.

## South Carolina.

The volume of general business has been good and, in general, up to reasonable expectations. There was, however, something of a general falling off in March, but April witnessed an increased activity. Merchants are usually well stocked with goods, and our advices indicate that they average somewhat more than usual. Our correspondents allude to the unsteadiness and weakness in prices and the narrow profits at which goods are sold. A demand for a better class of goods is, however, referred to. During the season there will be a good deal of activity in building, of which there will be more than for several years past, so that if the crops turn out well, which is at present expected, though, of course, there is the usual uncertainty on this point, it is expected that there will be a fine trade in the fall. Collections of accounts made last year are referred to as having been satisfactory, and there are indications that the ability and will to pay are improving generally. It would appear that manufacturers have had better business through the State than jobbers. Some few salesmen complain of the meagerness of orders. The increased number of new enterprises improves trade and arrests in some degree the outgo of money for manufactured goods.

## Alabama.

Advices from this State are cheerful and indicate a good condition of things. Business generally has been satisfactory, with but little reason for complaint, and where this is the case it is owing to special causes which do not represent conditions generally. Stocks of Hardware are well kept up and ample for requirements. The continued development of the State and its industries stimulates business. A good deal of building is indicated and, with good prospects for crops, a hopeful feeling prevails in regard to the fall trade. In agricultural sections farmers have had fine weather for their work, and they have been making good use of it. But little fault is found with collections, and money is referred to as easier now than for some time past. The development of Northern Alabama is progressing satisfactorily, and reports from this part of the State are especially hopeful. The following careful reviews of the situation from Birmingham and Mobile will be of interest:

**BIRMINGHAM.**—Making the comparison from January 1, 1888, to April 1, 1888, with the period of January 1 to April 1, 1889, our business is 25 per cent. ahead of last year. Collections are fair and the prospects for trade good. We account for the growth in trade over last year from the fact that our city is fast taking its place as one of the leading points for the distribution of goods, and we are constantly gaining new customers from territory that formerly we did not reach. Stocks of Hardware are large and well assorted. Bar Iron is selling lower here than at Southern competitive points, and as this is as in some sense taken as a test of

the market by purchasers, it has helped us to build up a trade that under other circumstances would have required more time. We see no immediate prospect for an advance in Bar Iron, nor do we see anything threatening ahead. Prospects for building good. We anticipate more building this year than at any period in the history of our city. It is too early to say much as to agriculture in this part of the South, since small grain does not amount to much here and the corn and cotton crops are just planted. The farmers are disposed to practice economy and exercise their usual diligence, and we may hope, with favorable weather, for good prospects. Most of the farmers are men of limited means and many of them are in debt—not more so than formerly, however, and the prospect may be said to be good. Our merchants have formed an association with a view to watching freight rates closely and other bearings that the railroads may have in affecting trade at this point in the way of running trains in and out of the city, &c.

**MOBILE.**—General business has been, and still continues, good for this season of the year, and from general reports has been equal to the past few years, if not better. Hardware business is also satisfactory, especially in Mill and Agricultural Supplies. Stocks of Hardware are fully equal to present demands. June 1 being the end of financial year they are naturally lighter than during the regular seasons. The disposition is to obtain a fair margin of profit, but this depends upon the desire of competing points to cut, which we regret to say is very frequently done. The prospects are that trade for the next few months will be very quiet, and naturally so as being between seasons. The prospects for building are very flattering. More improvements than usual are in hand, and it is expected an unusual activity will prevail during the coming summer months. Agricultural prospects are bright, and this has tended to uphold business in this section. It may safely be said that the best start has been made for five years. Collections have been satisfactory in measure, but it will be necessary to grant some extensions until fall, the same being well secured. Our salesmen representing us in the States of Florida, Mississippi, Georgia and Alabama report encouraging prospects for the coming season, and taking a general view of the situation, with no disastrous crops, we anticipate a large and healthful trade for the next year.

## Florida.

Trade has been rather quiet the last few months, and now that the dull season is commencing is falling off. The volume of business does not come up to former years, the effect of the yellow fever which prevailed last year being more or less seriously felt. Collections are only fair and are generally reported hard to make. If all goes well the present summer it is expected that there will be an excellent trade in the fall. The reports from other merchants are confirmed by the following from a well-known house in JACKSONVILLE:

Trade is slackening in all lines, and will be very dull during the next three months. The volume of business done does not come up to last year on account of the yellow fever last summer. Hardware merchants are running down their stocks, getting ready to take inventory in July. Prices in the main have been good, though there has been some cutting on staple goods. There is not much building going on and the outlook is not encouraging in that line. A few brick blocks and some small frame houses are, however, being put up. The early vegetable crops throughout the State have commenced to move. The crop is large and good prices are realized. Collections have been very fair since the epidemic last summer and are better than we anticipated. Our salesmen have had a good trade during the past three months. They report business slackening up throughout the State and that farmers have good prospects for good crops.

## Tennessee.

Both wholesale and retail trade appear to be in good shape, and it is a significant fact that the travelers from whom advices have been received refer to their business as having been more satisfactory than in many other States. Stocks of goods are well assorted and of about the usual size, perhaps on the whole a little larger than last year. The volume of business during the past season was satisfactory and but little fault is found with collections. The agricultural outlook is good and our advices generally are of an encouraging tenor; but, as reflecting the condition of things

through the State, we give below abstracts of reports received from some of the principal points. From CHATTANOOGA our advices are as follows:

Trade in general is fairly good and our Hardware business has been good since January 1, but is now quiet. In this section we have had exceptionally fine weather, which has induced country merchants to buy early. Stocks are fairly full, but not unusually large, and prices are low and irregular. Heavy goods appear to be weakening. The prospect for trade during the next few months appears to be tolerably good, and the outlook for building in Chattanooga and some of the neighboring towns is pretty fair. Crop prospects are also promising. Farmers and merchants appear to be in fairly good condition, as a general thing, and collections are thus far satisfactory. This section appears to be attracting the attention of Northern and Eastern capital, which will do much to develop our large mineral and agricultural interests.

From a well-known house in NASHVILLE we have the following report:

Business has been excellent since January 1, and our sales largely exceed those of 1887 or 1888, and payments are equally satisfactory. This State, especially the western part, is in excellent financial condition. Many new merchants have entered the field, and all seem to think the present year will have a very fine business. Hardware stocks are light. Prices have been low, but sales have more than made up the difference. We expect trade to be quiet until July 1, but are having, however, a nice demand for goods. Our country is growing, and every one has faith in its future. This is the country for young men, and small capital judiciously managed can be made to yield good profits. Salesmen report that their sales have been heavy this year. There have been but few failures.

From KNOXVILLE a prominent concern writes:

Business in general is very good and Hardware better than we have ever known it, because of the amount of building in prospect and process, the opening of new mines and the building of new railroads. Stocks of Hardware are about as usual. There is little complaint in regard to the cutting of prices. Agricultural prospects are unusually good, but collections are slow at present. They have, however, been good until within a few weeks. Traveling salesmen appear to be well pleased with the business they are doing, considering it is rather between seasons.

#### Minnesota.

General business during the year thus far has been a little slow and less in volume than usual, though from a few points, owing to special local circumstances, a much more active market is reported. This depression in trade, if it may be characterized by this term, is induced in good measure by the fact that the crops for the past two seasons were unsatisfactory, having been partial failures, so that, as a rule, the farmers have but little money. The decline in the price of wheat and the continued depression in the price of cattle also tend in the same direction. In this condition of things there has been only an average business in Hardware. Our correspondents, however, advise us that at the time of writing prospect for crops was good and the outlook for trade very satisfactory, though it will naturally be quiet until after harvest. In the cities there is a fair amount of building, but throughout the country generally comparatively little. Stocks of Hardware are below the average, the condition of the market at large and features of business in the State not having induced as liberal purchases as usual. With a good crop there is every indication of an excellent business in the fall, and the meager stocks in the hands of the trade would need extensive replenishing. The situation is thus summarized by a prominent jobbing house:

Business in general has been a little slower than usual at this season, but the spring trade has been quite satisfactory. Stocks of Hardware are about a fair average, and the outlook for trade during the next few months is good. More building is in progress or projected in the city of St. Paul than was ever before known. Everything looks favorable now for a good crop, but it is too early to prognosticate with any certainty. Collections are slow.

Other points are given in the following from another well-known house:

Farmers have very little to sell, crops having been partial failures for the last three years. The spring has been dry, thus retarding lumbering operations. Hardware is no exception to trade in general and is dull. Stocks of Hardware are light and there is little disposition to buy. Prices have been thus far much depressed, salesmen being inclined to cut. We do not look for much improvement until the crop prospects become apparent and are favorable. We hear but little about building and consider the prospects poor. It is too early in the season to say much about agricultural conditions. Considerable winter wheat was sown, but we think the weather has been unfavorable. Collections can be said to be fairly good.

#### Missouri.

Trade both in general business and Hardware has been very satisfactory thus far this year, nearly all our reports thus characterizing the condition. January and February business was in excess of the same months last year, but in March there was a falling off as compared with March, 1888, but April has been a decided improvement. A number of merchants refer to the year's business as in advance of preceding year by considerable percentages, while from some points business is referred to as about average, but with evidences of improvement in some respects. The prospect for future business is regarded as excellent, though this is, of course, largely dependent upon crops, which are, however, referred to as promising well, the indications pointing to an exceptionally large yield. Several of our correspondents allude to the prospects for winter wheat, corn, fruit, &c., as never having been better, and this condition of things following the good harvest of last year induces a hopeful feeling. As the winter was an open one opportunity was given for a good deal of building, and there is a fair amount now going on, with more in contemplation. In some places, however, there is not much activity in this direction. Stocks of Hardware in hands of retail merchants are rather small but well assorted, and a good deal of conservatism is observed in buying, their orders covering only their actual wants. Collections are fair to good and are evidently easier than in many other parts of the country. Taken all in all, trade in Missouri is in a healthful condition and anticipations are generally entertained of an excellent fall demand. Business in St. Joseph is in excellent condition, and the prospects for this center are regarded as very promising. The following report covers the features of business in KANSAS CITY:

There has been no decided increase in the volume of business thus far in '89 over '88, but a slight general improvement has been noted. Stocks in the hands of retail merchants are small and lighter than for several years. Prospects are for a better trade during the summer months, and jobbers anticipate a large fall business. Building is going on steadily. The growing crops are in excellent condition and indications are for the largest crop we have ever had. Collections are fair and traveling salesmen report prospects as good.

This review of the business in the State may appropriately be supplemented by the following careful report from a leading St. Louis house:

In regard to the general business condition of this locality we do not consider the situation very flattering, and have heard many complaints from many lines of business in regard both to the volume of trade and the prices. The Hardware trade seems to have been better than the majority of the other lines, and we cannot with justice find much fault with the volume of our spring business. Hardware stocks are generally small throughout the country, and it occurs to us that the average country merchant does not carry, as a rule, as heavy a stock of merchandise as he formerly did. The tone of the market as regards prices is very discouraging, but as it has been getting worse from year to year for a long time we have almost ceased to grumble. We cannot see that there is anything very promising in sight for the near future. The heaviest demand for

building material is over, the mild winter enabling carpenters to begin work much earlier than usual. The condition of the crops in this vicinity is good and ought to enable the farmer to save some money. Collections are only fair, and it requires constant reminders to bring them to time. It is well that we do not have to rely on one section of the country only. The conditions are very different in different localities. Some territories are good and promising more, others the reverse. There is nothing that we know of that will cause any great increase in the volume of trade, but the country tributary to this city is being settled more rapidly and commanding more attention than ever before and we look to that to create a healthy demand for goods.

#### Arkansas.

Reports from Arkansas are satisfactory and indicate a healthful condition of things. There is no general complaint of dull trade, the volume of which is up to reasonable expectations. The future course of business depends mainly on the crops, of which it is too early to form as yet a reliable estimate. The following report refers to the situation more in detail:

Business in general is in a healthy and thriving condition, with few complaints of dull trade. A splendid spring business has been done in Hardware, but the demand is now slackening up. Stocks are fair but not large, and are pretty well reduced by spring trade. A good deal of cutting in prices is going on, but taken as a whole they are fair. Trade will necessarily be quiet for the next few months, as is always the case in the Southern country. The prospects for building are good. New buildings are going up all over our State. Agricultural conditions as affecting trade are good, and collections to this time have been fair, but we may expect them to begin to be slow from this on until the new crop comes in, especially in the rural districts. Farmers are all busy putting in their crops, and we cannot tell much about the prospect of the year.

#### Kansas.

Trade in general is rather dull, and the volume of business thus far is not up to expectations. A similar remark may be made in regard to Hardware, which, like other lines, is quiet, with no prospect of improvement until after harvest. The purchases of the trade during the past few months have been for the most part limited to small quantities and for goods needed, without attempting to anticipate future wants. The reports given by travelers are not especially good, and they state that with their best efforts it is difficult to keep the volume of sales up to the average. The course of future trade depends almost entirely upon the result of the harvest, and it is generally agreed that if the crop is good there will be an exceptionally satisfactory business in the fall, and it is gratifying to note that the reports indicate almost universally that at the present time the outlook is especially good, crops of all kinds being in fine condition. The opening of Oklahoma has stimulated trade along the border, and, it is hoped, will give an increased business in the future. Farmers have but little money, and collections are slow and difficult. The general conditions, while trade is not as active as might be desired, are, however, regarded as healthful, and as affording a basis for a good business in the future, and, as stocks of Hardware are generally rather below the average, it is expected that when business revives a very satisfactory trade will be done, which will call for a prompt and general replenishing of stocks. We give below an abstract of two reports, the first from a representative retail merchant, and the second from a well-known wholesale jobbing house:

I do not hear of any line of business that reports good trade. Those who have had a fair volume complain of small margins. Hardware for a large section of country is very unsatisfactory as to amount and profits. Stocks generally are small. Buying is for sorting more than for stock. While prices are not demoralized, desirable customers undoubtedly are able to get goods under the general market. The crop prospects are better than any spring for a number of years, but money is not in the country to trade with. A good deal of caution is exercised in regard to



credits. The extent of building will depend on the coming season's crops. The failure of a large part of the crops for the last two years has been more injurious than merely the loss of the crops, as immigration has been greatly checked. All things considered collections are fair. Traveling salesmen are comparatively scarce and few report any increased sales. The drummers who used to call in 30 to 60 days one or two years ago have not been here in months. The future trade depends entirely on coming crops, which have a good showing now, so that there is good reason to expect a good fall business.

Business is light in all lines, as well as in Hardware. Stocks are good, and may be regarded as large for the conditions of trade. Prices are low and steady and margins small. The probability is that spring and summer trade will be light. The outlook for crops would indicate a good or at least an increased fall trade. The prospects for building are only moderate. Crops were a partial failure last year, but the outlook this year so far is magnificent. Collections are pretty slow, but as good as could be expected. Traveling salesmen are hopeful for the future. The prospects for trade in Kansas and Nebraska are all right if we get a crop, otherwise not.

#### Nebraska.

Business in this State has been steady, and of volume equal to former years with generally very satisfactory conditions. Prices as a rule are holding their own, but there are no evidences of overstocking or demoralization of prices locally. There seems to be a disposition on the part of consumers to purchase carefully and the trade also have been conservative in not ordering beyond their requirements. About the only unfavorable condition to be noted is the low prices ruling for cattle and farm products generally, but last year crops were excellent and the prospects for this year's crops are uniformly reported good, the ground being in excellent condition, so that the outlook in this regard is considered especially favorable. A large proportion of last year's crop is still in the hands of the farmers, who are holding it on account of the low prices ruling. An influx of immigrants is reported throughout the State. There will evidently be a large amount of building, especially in the cities and large towns. Collections are fairly good, and consumers are reported as owing less to dealers than for some years past, though from some quarters collections are referred to as below average. The general impression received is, however, that they are reasonably good. In this condition of things a satisfactory business is expected during the summer, and especially an improved demand in building Hardware and Tools.

#### Dakota.

In sympathy with the condition of general business, Hardware is dull, there being a disposition to wait until the crops for this season are harvested. Sales during the season have been below the average and trade has been in most instances sluggish, with reports of fair activity in some points where local conditions are favorable. The outlook for the crops is promising, but it is too early to predict with confidence; the general impression prevails that if they are good there will be an exceptionally active trade in the fall. Collections have been on the whole rather poor, but some of our correspondents state that in the fall of 1888 and last winter collections were exceptionally good, and many debts were paid and mortgages canceled. Prices are without special features, but have been to a good extent cut by merchants in order to induce sales. We receive advices from a number of points that business generally has been considerably demoralized by the territorial and local farmers' alliances, who endeavor to do business without the aid of merchants. The following additional advices in regard to trade in the Black Hills will be of interest:

General business has been better than in 1888 or 1887, and is in much more satisfactory condition as regards credit than ever before.

There have been more cash sales and shorter credits given. Hardware has been as good, if not much better, than other lines of trade. Stocks of Hardware are unusually small, owing to a good spring trade and the more conservative manner of buying goods, dealers having found that it does not pay to overstock. The prospect for trade during the next few months is good, and in this section there will be more building than any year since 1878 except 1886. Last year there were big crops and there is every indication of good crops this year. Farmers are gradually improving their financial condition. Collections are fair, being better than 1887 or 1888 and not as good as 1886. The prospects for mining developments are good, quarries are being opened up and some manufacturing industries started.

#### The Cut-Nail Extras.

The fact has occasionally been alluded to in our Western market reports that the practice is growing of making a low base price on Cut Nails, which is graduated according to the quantity of small Nails included in an order. Quite a number of Nail manufacturers had been in the habit of doing something similar whenever they found prices getting down to an unremunerative point. They insisted on their customers making up assorted orders to average a certain advance over the base, to get the benefit of the lowest price current. For instance, if the price of Nails fell to \$1.65 at the factory, they continued to sell, but they carefully watched specifications and made an average of 25 cents or 30 cents above base an essential requisite for the acceptance of the order. The new arrangement, however, is based on a scheme which is not so productive to the manufacturers. The old way erected a structure of possible profit on a foundation of unremunerative business. The new way cuts into the foundation still deeper and diminishes profits merely for the sake of making sales.

This new departure is perhaps merely an outgrowth of the times, and the depression of the Nail trade is more to blame for it than the manufacturers who are charged with its parentage. The Bar-Iron manufacturers passed through a similar experience just about a year since, when their card of extras was cut in two by the formal announcement of a prominent firm, who merely did openly and above-board what their competitors were doing, and had been doing quietly, but almost universally. The Bar-Iron extras were attacked by the manufacturers themselves, because in comparison with the base price for Iron they were undoubtedly high, and presented a tempting opportunity to be used for bait to catch an order. The progress of the times had outgrown the old card of extras, and no single concern was really responsible for the revision which was thus forced. The changes of the future will probably tend to the further reduction of such extras rather than their restoration to the old figures. The Cut Nail extras are susceptible to the same influences, and are being affected by the same cause. A level of prices will be struck which will appear to establish a more natural relation between low base rates and extras for small sizes, and there the movement downward will halt for a time, as in the case of Bar-Iron, unless the power of the combined Western manufacturers can restore the old conditions, which does not now seem probable.

This new method of selling Nails has injected into the trade some very annoying features to jobbers and retail merchants. All are, of course, anxious to get the lowest base prices, and they consequently order assortments, including the necessary quantity of small Nails, to cover the requisite average above the base. The jobbers are enabled to do this with somewhat of ease, as they handle large stocks of every size. Retail merchants, however, load themselves up with small Nails enough to last for some time, but soon run out of large Nails, and are then in the

market for base sizes. They apply to jobbers for small lots of such sizes, and find that their trade is regarded as undesirable, because the jobbers are obliged to take care of their regular customers who are purchasing assortments. Jobbers are now instructing their salesmen to be very careful in making sales of Nails for this reason.

The manufacturers are discussing this new phase of the Nail situation with much interest, as they see in it the threatened destruction of their only opportunity to get a profit from the sale of Nails. The reduced cost to dealers of the smaller sizes of Nails may restore to the Cut-Nail trade a large part of the business which has been wrested from it by the Tack and Wire-Nail makers, but that would be a barren victory if it were accomplished by the total sacrifice of profits. It is by no means regarded as a compensation for the loss to be sustained. Some of the manufacturers suggest the adoption of a certain price for each size of Cut Nail, so that a dealer can buy what he chooses and just as large a quantity of each size as he desires, without reference to any other sizes in his order. Predictions are being made now that the Cut-Nail trade will adjust itself on a basis of this kind or something approaching it within the next six months.

#### Miscellaneous Prices.

The following is the new association price list of inside Iron Strapped Blocks, which was adopted by the manufacturers, to go into effect after May 1. The discount applying to the rest of the list applies to this new list also:

#### Inside Iron Strapped Blocks.

Size.	Mortise.	Iron bushed.			Roller bushed.		
		Single.	Double.	Triple.	Single.	Double.	Triple.
3	9-16	\$0.70	\$1.30	\$1.75	\$1.10	\$2.00	\$2.90
3 1/4	9-16	.75	1.45	2.00	1.15	2.20	3.15
4	11-16	.85	1.60	2.15	1.20	2.25	3.25
5	3/8	.90	1.75	2.25	1.25	2.35	3.50
6	1	1.10	2.00	2.90	1.50	2.85	4.40
7	1 1/8	1.30	2.40	3.50	1.70	3.35	5.00
8	1 1/4	1.65	2.85	4.25	2.25	4.15	6.00
9	1 1/2	1.85	3.40	4.75	2.50	4.70	7.25
10	1 3/8	2.75	4.50	6.25	3.50	6.00	8.50
11	1 3/4	Same list as 12 inch.	Same list as 12 inch.	Same list as 12 inch.	Same list as 12 inch.	Same list as 12 inch.	Same list as 12 inch.
12	1 1/2	4.45	7.50	10.65	5.30	9.20	13.30
13	1 1/4	Same list as 14 inch.	Same list as 14 inch.	Same list as 14 inch.	Same list as 14 inch.	Same list as 14 inch.	Same list as 14 inch.
14	1 1/2	7.00	10.50	15.00	8.15	12.80	18.45
15	1 3/4	8.00	13.00	18.00	9.25	15.50	21.75
16	1 3/8	10.00	15.00	22.00	11.50	18.00	26.50

Walter Coleman & Son, Providence, R. I., have issued the following new and reduced list of Iron Sheaves for Tackle Blocks. As the dimensions of the Sheaves are well known they are referred to by numbers, the number being the size of the Block that the Sheave fits. The Common Sheaves are subject to a discount of 30 per cent., and the Patent Sheaves to a discount of 45 per cent.

Number.....	3	3 1/4	4	4 1/4	5	6
Common; new price.....	\$0.05	.05	.06	.08	.10	.12
Patent; new price.....	\$0.34	.37	.40	.44	.46	.53
Number.....	7	8	9	10	11	12
Common; new price.....	\$0.15	.21	.24	.36	.40	.56
Patent; new price.....	\$0.62	.70	.81	1.08	1.15	1.40
Number.....	13	14	15	16		
Common; new price.....	\$0.68	.90	1.06	1.25		
Patent; new price.....	\$1.75	1.95	2.35	3.00		

#### Items.

John Wilson, the well-known manufacturer of Butchers', Skinning and Sticking Knives and Butchers' Steels, Shoe Knives, &c., Sheffield, England, has appointed Hermann Boker & Co., 101 and 103 Duane street, New York, his sole agents

for the sale of these goods in the United States, and he requests that orders either for importation or from stock be addressed to them. Hermann Boker & Co., referring to this announcement, state that they have accepted this sole agency and will carry a full stock of the goods on hand, while orders for importation will be filled as promptly as possible. This arrangement by which the efficient marketing of this leading line of goods will be secured, and the convenience of the purchasers thus served, will be appreciated by the trade. Formal announcements are made of this agency on page 70.

The Medford Fancy Goods Company, 44 and 46 Duane street, New York, who are, we believe, the only exclusive manufacturers of Dog Collars and Furnishings in the world, in their advertisement on page 80 call attention to the inducement they offer to the trade of first orders and refer also to the extent of their stock and the quality of their goods.

S. A. Munger & Co., Detroit, Mich., issue a price current showing the Otsego Farming and Garden Tools, Shovels, Spades, Wire Cloth, Screen Doors and Windows, Lawn Mowers, Refrigerators, Freezers and other seasonable goods.

The trade will learn with regret of the death, on the 20th ult., of Geo. R. Kelsey, president of the American Buckle and Cartridge Company, West Haven, Conn.

Hartman Mfg. Company, Beaver Falls, Pa., issue a neat pamphlet describing the Steel Picket Fence and Gates of their manufacture. Full description is given of this Fencing as constructed of heavy Steel Wire which cannot be broken, and is firmly held by steel posts driven deep into the ground and anchored there so that they cannot be uprooted. Other advantages possessed by this Fencing are pointed out, its beauty, durability, convenience and economy being emphasized. Different patterns of Gate, Corner and Line Posts are shown and a number of testimonials given. The Flexible Steel Wire Mat is also represented.

In these times when increased attention is given to elegant printing for trade purposes, the advertisement on page 53 of John A. Lowell & Co., Boston, Mass., will be of special interest. It calls attention to their engraving and printing, which, as well known, is artistic and of a high order. They also emphasize the fact that they are in a position to furnish original ideas by means of which their work may be made especially attractive and serviceable to their patrons.

The Ambler Saw Mfg. Company, Natick, Mass., issue a circular relating to their Band Saws and Band Saw Tools and Machinery. Their Band Saw Filing Machine is especially referred to and a list of representative houses using it given.

In their advertisement on page 68 the Holmes & Edwards Silver Company, Bridgeport, Conn., call attention to their Durham Silver Metal Spoons, Forks, &c., a line, it will be understood, of solid metal goods unplated. This is, we believe, the original brand of this class of goods, and the company allude to the success which has attended its sale, and the uniformity of the quality and finish.

It will be seen that in their advertisement on page 81 C. F. Guyon & Co., 99 Reade street, New York, call attention to their extensive line of agencies, and illustrate the Pin Tumbler Rim Latch made by the Brooklyn Lock Company, for whom they are representatives.

John R. Scott has opened a retail Hardware store at 112 Randolph street, Chicago. He will carry a general line, but will pay special attention to Builders'

Hardware, Cutlery and Tools. Mr. Scott was connected with Kellogg, Johnson & Bliss for 12 years, having been a partner for the last three or four years of the connection, and during the past year he was one of the managers of the Chicago branch of P. & F. Corbin. He is thus well equipped to handle the trade of contractors and builders.

William Willer, of Milwaukee, Wis., has issued a price list for the spring of 1889 covering the Willer Sliding Window Screens and custom-made Screen Doors manufactured by him for fine residences and other buildings. His Sliding Screens are balanced by springs and can be moved to any part of the window, remaining wherever placed. They are made in a variety of styles and of all sizes. The circular shows a large number of designs of Screen Doors, from plain patterns to very ornate frames, each design being numbered for facility in ordering. They will be furnished in all the usual kinds of wood, covered with black wire cloth, or will be covered with other cloth if specially ordered.

The American Folding Chair Company, St. Louis, Mo., issue a collection of illustrations made by photographic process of their Settees and Chairs for lawn use. They allude to their line for this year as superior to any they have yet manufactured.

Among the business opportunities announced on page 59 those looking for such an opening will observe an advertisement relating to the sale of a Hardware house with an established business, in West Massachusetts. The stock carried is mentioned as about \$30,000, and the desirability of the opportunity is alluded to.

Dame, Stoddard & Kendall, Boston, Mass., in their advertisement on page 78 make, it will be observed, a seasonable announcement in regard to Fishing Tackle, and illustrate Skinner's Fluted Trolling Spoon Baits, and call attention to leading lines of Fishing Tackle, &c., for which they are agents.

The trade will observe the advertisement of Henry Disston & Sons, Philadelphia, Pa., occupying page 73, in which they illustrate some of their leading Cross-cut Saws, and call attention to their special features, the method of manufacture, &c.

We are advised by the Toledo Block Works, Toledo, Ohio, that they have appointed J. C. McCarty & Co., 97 Chambers street, New York, their agents for the sale of their Tackle Blocks, who will carry a stock for the convenience of the trade and will be prepared at all times to name the manufacturers' list prices.

An announcement of some unusual interest is made on pages 84 and 85, in which Morley Bros., East Saginaw, Mich., call attention to their new catalogue of about 1000 pages, and state that they will send it with a shipment of \$100 worth of shelf goods or goods of their own manufacture. The arrangement of this catalogue, covering Hardware, Tin-Ware, Wagon Stock, Mill Supplies and other lines, makes it especially desirable, and the trade will appreciate the opportunity of having such a book. An interesting illustration is also given of their different stores, warehouse, factory, &c.

#### Arrangement of Stores.

Our attention has been called to a number of excellent devices for arranging stock which have originated with J. F. Wollensak, 227 Lake street, Chicago. Prominent among them is a case for holding retail stocks of Screws, Rivets, Escutcheon Pins, Trunk Nails, Machine Screws, Copper Washers, and all small articles of that kind which require a great deal of room when they are kept in com-

plete variety. This case is illustrated below, Fig. 338. The case is constructed in sections, each section containing two large drawers or slides, as shown in the cut. The top is used as a desk or counter. The slides are mounted on rollers such as are used for theatrical scenery, so that they can be moved in and out easily. Each

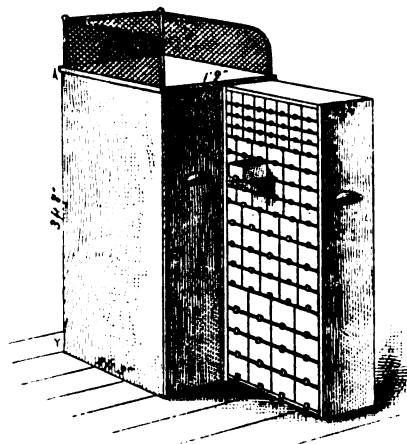


Fig. 338.—Screw and Rivet Case.

slide is fitted with shelves to suit the proposed contents. Screws are kept in the sample-case shown. The shelves are made of  $\frac{1}{4}$ -inch pine and have no upright partitions, the small drawers fitting up closely against one another. These drawers have leather pulls attached to them instead of Screw Eyes, as the latter, being rigid,

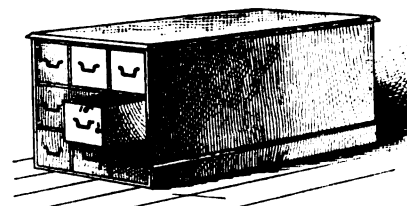


Fig. 339.—Case for Tubing.

might be bent or knocked off in pushing the slide in or pulling it out. The shelves are placed  $1\frac{1}{2}$  inches apart on the top four rows of small drawers,  $1\frac{1}{4}$  inches apart on the next four,  $2\frac{1}{4}$  inches on next four and  $2\frac{1}{2}$  inches apart on the lowest four. The number of drawers ranges from nine on the top shelf to five on the lowest. The drawers are made of thin wood, with

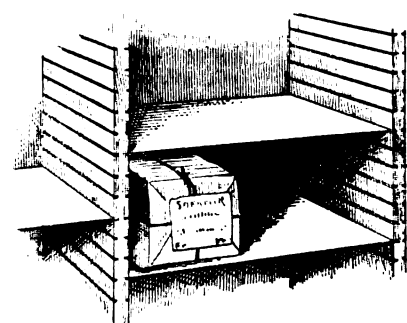


Fig. 340.—Method of Arranging Adjustable Shelving.

a slight taper toward the back, so that they will slide in easily, but they could be made of paper. Each drawer is, of course, properly labeled and each is calculated to hold a paper of Screws, with a little margin in addition. It will be seen that the goods are doubly protected from dampness and dust. Flexible Tubing, or Gas Hose, has been found

somewhat difficult to keep properly, because of its length and its liability to "set" if coiled for any length of time. The plan adopted by Mr. Wollensak overcomes all objections. He has had a case of drawers made, as illustrated above, Fig. 339. The case is 6 feet 6 inches long, 36 inches wide and 38 inches high, and the drawers are nine in number, each 9 inches high by 10 inches wide, and they slide in at the end of the case, so as to extend its whole length. They thus accommodate the Tubing laid perfectly straight in the usual 6-foot lengths. The Tubing being flexible, yet stiff enough to push into the drawers easily, it is not necessary to have room enough in front of the drawers to pull them out far when taking out goods or storing them away. The top of the case is used as a counter.

The space on the floor under shelving is usually wasted, as it is an undesirable place to store goods, on account of the dust and dirt. Mr. Wollensak utilizes this space for boxes made to fit up close to the shelf above and mounted on heavy double-roller casters. In these boxes heavy goods are carried. They are easily rolled out on the floor when access to their contents is desired, and they can be wheeled to other parts of the store to be filled or emptied. One upright is used to every two boxes in this store, instead of partitions at the side of each one. A system of shelving, Fig. 340, adapted for broken or mixed stocks, is very ingenious, and would be desirable in quite a number of cases in which fixed shelving is used. The uprights are made of  $\frac{1}{2}$ -inch boards, with a series of shallow cuts made across them by a rip-saw, these cuts extending from the bottom to the top of the uprights, just  $1\frac{1}{4}$  inches apart. The uprights are placed  $1\frac{1}{2}$  feet apart, and between them the shelves extend, which are made of No. 14 sheet iron, cut to fit nicely and japanned, so as not to rust. These shelves can be moved by means of the cuts in the uprights so as to leave any desired space between them. Small packages can thus be placed separately on the shelves instead of being piled up, as would be necessary with fixed shelving. No space is wasted, as the shelves are so easily shifted to suit the size of any kind of a package.

#### Exports.

PER BARK REBECCA CROWELL, APRIL 11, 1889,  
FOR BRISBANE, QUEENSLAND.

By H. W. Peabody & Co.—11 packages Hardware, 20 cases Fire-Arms, 11,238 pounds Barb Wire, 53 packages Hardware, 13 crates Stoves, 12 dozen Handles, 10 packages Lampware, 1 case Wringers, 22,474 pounds Barb Wire, 3 packages Road Machinery, 1 case Steel.

By A. S. Lascelles & Co.—44 dozen Axes, 6 dozen Picks, 17 cases Handles, 3 cases Hardware, 20 dozen Hatchets, 16 dozen Hammers, 6 cases Scales, 1 crate Trucks, 1 box Wheels, 100 boxes Clothes Pins, 10 dozen Wash-Boards,  $\frac{1}{4}$  gross Grease, 8 cases Tacks, 280 pounds Nails, 13 dozen Wrenches.

By F. B. Wheeler & Co.—1 case Buggies and 1 pair Shafts, 300 dozen Handles, 120 dozen Handles, 86 dozen Handles, 5 cases Buggies, 5 pairs Shafts, 2 cases Buggies, 2 pairs Shafts, 5 cases Axes, 2 cases Tumblers, 13 gross Cow Bells.

By Coombs, Crosby & Eddy.—50 dozen Handles, 1 dozen Wheelbarrows.

By Winchester Repeating Arms Company.—24 Guns, 20,000 Primers, 1020 Metallic Cartridges.

By R. W. Cameron & Co.—10 dozen Handled Axes.

By V. Basanta.—5 dozen Mattocks, 220 dozen Slates, 10 gross Toy Pistols, 9 dozen Door Springs, 5 cases Tacks, 12 dozen Locks, &c.

By Arkell & Douglas.—30 dozen Edge Tools, 3 Ranges, 5 dozen Edge Tools, 35 cases Edge Tools, 25 dozen Wash-Boards, 24 dozen Wash-Boards, 10 cases Axle Grease, 10 crates Polish, 10 dozen Edge Tools, 10 gross Blacking, 2200 feet Hose, 2 cases Hoes, 2 barrels Blocks, 2 cases Axle Grease, 763 pounds Bolts, 7 packages Hardware, 13 cases Lawn Mowers, 600 feet Hose, 36 crates Refrigerators, 6 crates Stoves, 19 packages Hardware, 48 cases Edge Tools, 6 cases Handles, 5 cases Bolts, 58 cases Handles, 6 crates Shellers, 42 packages Hardware.

#### Business Changes.

The well-known house of J. C. McCarty & Co., 97 Chambers street, New York, has been reorganized, as per the following announcements:

NEW YORK, May 1, 1889.

Notice is hereby given that the copartnership heretofore existing between the undersigned, under the firm name of J. C. McCarty & Co., expired by limitation on the 30th ult., and that all accounts due the late firm are to be adjusted with and be paid to the new firm of J. C. McCarty & Co., formed this day as stated below.

J. C. McCARTY,  
W. H. LITTELL,  
T. P. BURKE,  
JAMES SURPLESS.

NEW YORK, May 1, 1889.

Referring to the above notice of dissolution, the undersigned beg to inform their friends and the Hardware trade generally that they will continue the business of Hardware manufacturers' agents from this date at the old location under the firm name of J. C. McCarty & Co., and they respectfully solicit a continuance of the confidence and patronage with which they have been honored in their former relations.

J. C. McCARTY,  
W. H. LITTELL,  
T. P. BURKE.

The business will thus be carried on without change of name and with the same lines of agencies representing many of the leading kinds of Hardware.

Connected with the above change we have this announcement in regard to a new firm under the style of Surpluss, Dunn & Alder:

NEW YORK, May 1, 1889.

The undersigned have this day formed a copartnership under the firm name of Surpluss, Dunn & Alder, at 97 Chambers and 79 Reade streets, for the transaction of the Hardware commission business. Trusting that our old friends will remember us in our new departure as they have in the past, we are

Yours truly,

JAMES SURPLESS,  
ROBERT W. DUNN,  
BENJAMIN S. ALDER.

Of these gentlemen Mr. Surpluss was a member of the firm of J. C. McCarty & Co., and he and his partners in the new firm have been connected with the Hardware trade for a number of years, so that they are widely and favorably known. They enter upon their commission Hardware business under promising auspices, representing the following well-known manufacturers, whose products include, it will be observed, a varied line of leading goods:

The Gutta-Percha and Rubber Mfg. Co.,  
Capitol Mfg. Company,  
H. Chapin's Son,  
Keystone Lock Works,  
Lindsay & McCutcheon,  
Cronk Hanger Company,  
Chadborn & Coldwell Mfg. Company,  
The Western Block Company,  
Nes Chain Mfg. Company,  
Champion Blower and Forge Company,  
John Auer, Jr.

Their announcement giving further particulars in regard to their agencies, & mentioning that they give special attention to the export trade, will be found on page 82. In these new departures both J. C. McCarty & Co. and Surpluss, Dunn & Alder will have the best wishes of the trade for their success.

#### Inaccuracy in Designating Chain.

With reference to the tendency on the part of manufacturers to designate Coil and other Chains inaccurately, as the Chain is made larger than the size for which it is sold, we have the following communication from one of our correspondents, in which the mischief of this practice is alluded to and an earnest appeal made for a return to accuracy in this regard:

We are much interested by the discussion of the nominal and real size of Coil Chain in your issue of April 4. There is

no question but that, starting possibly with the small difference of  $\frac{1}{16}$  larger than the marked size, this fraction has grown, as your correspondents themselves acknowledge, through various stages,  $\frac{1}{8}$  into  $\frac{1}{4}$ , so that in many cases the  $\frac{1}{4}$  Chain measures  $\frac{1}{2}$ ;  $\frac{1}{2}$  measures  $\frac{3}{4}$ ;  $\frac{3}{4}$  measures  $1$ , or so slightly scant as to be hardly appreciable by instruments even of accurate measure. That this is wrong is readily acknowledged by the very ones who are parties to the fraud or attempted fraud. It would be just as ridiculous to call No. 4 Iron (whose diameter is, as your correspondent says, 0.238)  $\frac{1}{2}$  and attempt to sell it for  $\frac{1}{2}$ , to be cut by  $\frac{1}{2}$  dies and fit  $\frac{1}{2}$  Nuts, as to attempt to pass off Chain of that diameter for  $\frac{1}{4}$ . It would be equally absurd to sell a 9d Nail for an 8d Nail. In short, the practice or deceptive making or marking should not be tolerated by either consumer or handler. This way of cutting price by furnishing wrong sizes meets its parallel in certain other trades. In dry goods, for instance, up to recently a bolt of ribbon marked 12 yards had been gradually reduced in length till the ribbon thereon measured only 10 $\frac{1}{2}$  yards. But this discrepancy became so glaring that the labels themselves are now stamped 10 yards; 10-4 wide goods are barely over 9-4; 24-inch silks run 23; 2-yard table linens are scant from 3 to 4 inches, but the writer is assured by the shoppers in his family that this practice is being steadily discountenanced more and more until the label is beginning to nearly represent the actual measure. Deception must of necessity be short-lived, and it is wholly unworthy of those engaged in the manufacture or dispensing of Hardware to lend themselves to any device so unworthy of goods where really mathematical exactness ought to govern. A 6 $\frac{1}{2}$ -6-2 Trace should mean exactly what it says. Those manufacturers who can make and sell with equal readiness a Chain five links to the foot should sell it for five links and establish a difference in price between the two. A  $\frac{1}{4}$  Tire Bolt, too, might well be  $\frac{1}{4}$ , not  $\frac{1}{2}$  scant.

Let every one set his face against what he must condemn in a moment of serious thought, and the complaints which are fully justified under the present conditions will disappear. By French law any article that might be mistaken for something more valuable must be marked "imitation." We hope the day is far distant when any such label could be justified on American Hardware. If "a just weight is a delight" to the Almighty, we take it He looks with equal favor on a Chain properly calipered or gauged.

#### FRACTION.

The territory of Oklahoma, as defined by the Springer bill, includes Oklahoma proper, "the Cherokee Outlet," and the so-called "No Man's Land," or "Public Land Strip," and is bounded as follows: On the west by Texas and New Mexico, on the north by Colorado and Kansas, on the east by the reservation occupied by the Cherokee tribe of Indians east of the ninety-sixth meridian of west longitude and by the Creek, Seminole and Chickasaw reservations, and on the south by the Creek, Seminole and Chickasaw reservations and by Texas. Its acreage is as follows: Cherokee Outlet, 6,022,244 acres; Public Land Strip, 3,672,640; Oklahoma proper, 1,887,800. That portion of these lands just opened for settlement by proclamation of the President lies very near the center of the Indian Territory.

Contracts for the manufacture of nine iron oil tanks of 40,000 barrels each for the Globe Refining Company, the Standard's rival, have been awarded. The tanks will be located on the Delaware River front, where a large plant is in course of preparation.

### Barn-Door Latch.

Johnson & Co., Marysville, Ohio, are inviting the attention of the hardware trade to what they designate as the Steel-Plate

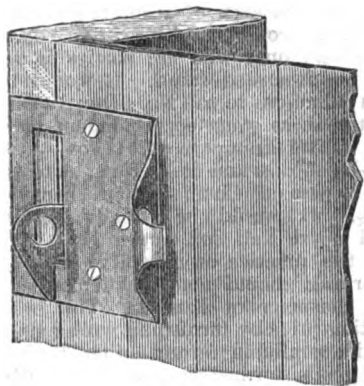


Fig. 1.—Position when Door is Closed.

barn-door latch, for which they claim it is the only barn-door latch that can be opened or locked from either side of the door. Among the other advantages also claimed is that it will allow the door to shrink or sway  $\frac{1}{4}$  inch and still perform its function. The round hole shown in Fig. 1 is for the purpose of hanging the lock when not in use, and does not interfere with the handle when opening the door; the latter can also be securely locked on the inside with a nail placed over the catch as shown in Fig. 2 and the outside by means of a padlock inserted through the hole in the catch. It is claimed that when locked from the inside it cannot be opened from the outside by any device, thereby

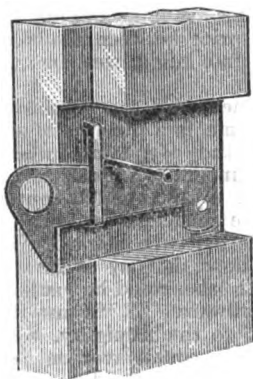
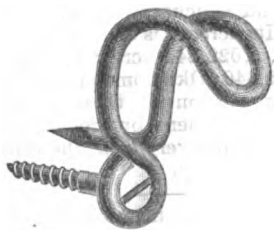


Fig. 2.—Position of Catch on Post.

affording absolute security and protection. The material used is described as the best steel plate procurable, giving great strength and durability.

### Wire Sash Lift.

The illustration herewith given represents the Climax wire sash lift, which is put on the market by the Van Wagoner



Wire Sash Lift.

& Williams Company, 82 Beekman street, New York. It has, it will be observed, a single loop, and thus differs from the Gem,

which is made with a double loop. It is especially adapted for window screens and as a pull for screen doors. It is furnished coppered, walnut bronzed, nickel-plated on brass, or in brass.

### New Corkscrews.

The accompanying illustrations represent additional patterns of corkscrews which are put on the market by James D.



Fig. 1.—Self-Extracting Corkscrew.

Frary, Meriden, Conn. Fig. 1 represents a self-extracting screw, the cut being half size. It is so constructed that it is to be turned until the flange reaches the cork, when, by continued turning and a slight pull, it is stated, the hardest cork can be extracted. It is made either bronzed or in full nickel-plate. Fig. 2 represents a spiral twist corkscrew with pick or wire

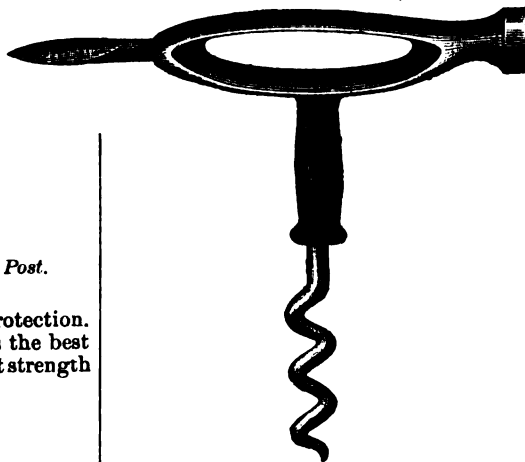


Fig. 2.—Corkscrew with Pick or Wire Stripper.

stripper. This also is made bronzed or full nickel-plate.

Who shall dig the Nicaragua Canal is a question now before the courts. The American Atlantic and Pacific Ship Canal Company, through their attorney, have given notice to the Maritime Canal Company, of Nicaragua, that they will apply to the Supreme Court for a permanent injunction upon this work, contending that the State of Nicaragua granted to Cornelius Vanderbilt and other citizens of the United States the exclusive right of constructing a ship canal across its territory.

### The Blackmore Pipe-Hanger.

A new style of pipe-hanger which embodies a number of valuable features is being manufactured and offered to the trade by



Fig. 1.—General View of Hanger.

G. C. Blackmore, 152 Central avenue, Newark, N. J. The two illustrations presented herewith so clearly show its features of construction that only a few words of description will be necessary. Fig. 1 shows the pipe-hanger ready for use, while Fig. 2 shows it with the parts separate. The hanger consists of a hinged stirrup made of cast iron supported by a double hook of the same material, this in turn screwing on to a lag-screw of wrought iron. The upper portion of the lag-screw is cut with a large thread, suitable for screwing into wood, while the lower end has a  $\frac{1}{4}$ -inch pipe thread cut on it. The bottom of the lag-screw screws into the socket of the double hook, which is threaded on the inside. The lag-screws are made 4, 6, 9 and 12 inches long; while if any intermediate length is required a screw can be cut off and threaded with an ordinary pipe-fitter's die. At present the hangers are made in four sizes, adapted to 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  and 2 inches, but the manufacturer expects soon to make them in all sizes up to 6 inches. The method of supporting the stirrup by

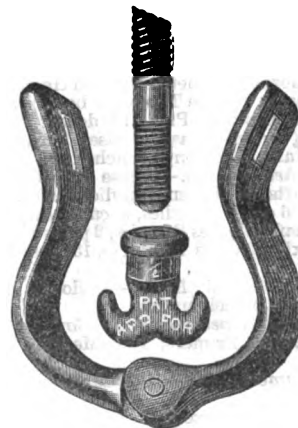


Fig. 2.—Hanger with Parts Separate.

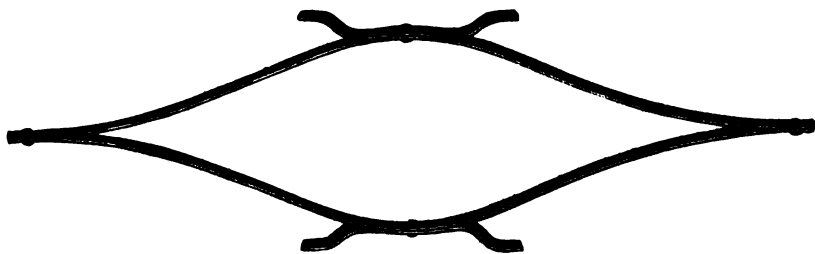
cast-iron hooks permits of a horizontal motion of  $2\frac{1}{4}$  inches. In referring to the special merits of this device the manufacturer alludes to the fact that there is no bolt to wear through and drop the pipe; and also that the material from which it is made renders it very cheap. The hangers can, of course, be finished in any manner desired.



**Cliff's Seat Spring.**

The accompanying illustration represents this article, which is put on the market by Titus & Babcock, Rochester, N. Y. As shown in the cut, it will be observed that the manner in which it is constructed does

means of this leg the lamp is raised about 3 inches from the table. As will be seen, the legs have a slight flare, which gives to the lamp greater firmness and rigidity, rendering it less liable to be overturned. The company furnish these legs separate from the lamps, and they are so simple of



Cliff's Seat Spring.

away with the hinge or knuckle found in other springs, the ends being simply riveted together, and it is to be noted also that it is a graduated seat spring and adapted for one, two or three persons, doing away with the necessity for carrying more than one size in stock. It has also, it will be seen, a chair above and below, which greatly facilitates its attachment, as it can be bolted directly, without fitting a wooden piece, to the seat to which it is applied and the board to which it is fastened. It is described as made of the best quality of steel, and as being soft and easy in its action and in all respects satisfactory.

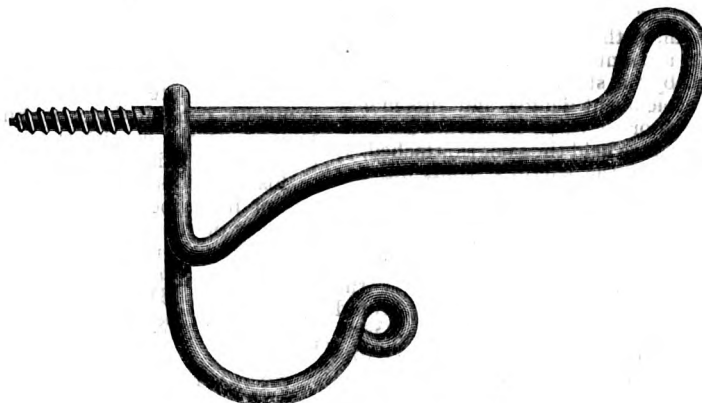
**Novel Stove Leg.**

The American Oil Stove Company, of Gardner, Mass., are bringing out their lamp stoves provided with a very simple yet effective leg, the construction of which cannot fail to command the attention of the trade. The company have been engaged for some time past in devising a leg which could be easily and rapidly taken off and put on to their lamp stoves, and in the device which is shown in the accompanying engraving they feel that they have accomplished the object sought. As will be seen from the cut, the top of the leg catches on to the small ribs on the top

construction that they may be readily applied by any one.

**Crown Wire Coat and Hat Hooks.**

The illustration given below represents a style of wire coat and hat hooks called the Crown, which is put on the market by



Crown Wire Coat and Hat Hook.

the Van Wagoner & Williams Company, 82 Beekman street, New York. It will be observed that it differs in pattern from the Gem hooks and is offered at a somewhat



A Novel Stove Leg.

of the oil tank, while a stove bolt goes through the center of the leg at the rosette. To the end of this bolt is a nut which engages behind the small slot shown in the base of the oil tank. By

lower price. It is made in sizes 2½, 3 and 3½ inch, and also as a single hook in 2-inch size. They are furnished either coppered or japanned, and are put up half gross in a box or 12 gross in a case.

**Commercial Travelers Thirty Years Ago.**

We find the following interesting item in a recent issue of the *Crockery and Glassware Journal*:

"It amuses me," said the white-haired head of a jobbing house, "to hear traveling men nowadays complain of the hardships of the road, the taking of late trains, traveling in cabooses, and such like inconveniences. Lord bless you! they should have seen the drummers of the old days and heard their experiences and then they would have known something about the woes of the traveling man. Thirty years ago I was young, ambitious, full of energy, and went on the road for a jobbing house. When I could not travel by river—and that could be done only by going through a certain portion of our trade—stage coaches and horseback were the only means of travel. Many a cold and weary winter's day have I passed in the saddle, starting out early in the morning, going through snow or rain, fording creeks, and half frozen all the time, until I could hardly dismount when my day's journey was over. And then there were no banks or collection agencies through the country to facilitate the collections of debts, and

the drummers had all of that work to do. We traveled with old-fashioned valises, which could be used as saddlebags when we had to ride horseback, and these were the receptacles for what money was collected. It was sometimes pretty ticklish work stopping at lonely country taverns with saddlebags filled with good, hard money, but it had to be done. I slept on the floor in a little tavern office one winter's night with my valise under my head for a pillow, containing over \$1500 cash. It was a hard pillow, but I felt safer with it there, and slept quite soundly. The drummers of to-day don't know what hard traveling is. They should have frozen or half-drowned or starved with us in the old school back in the '50s."

After reading the first accounts of the destruction by floods of the famous Verrugas Bridge, on the Oroya railroad line in Peru, which was 260 feet high, and cost \$500,000, wonder was expressed that such a casualty could occur. Later accounts show that a "cloud burst" caused a mass of rocks and earth to sweep down the mountain, carrying away the bridge.

It is definitely announced that Presidents Adams, of the Union Pacific, and Perkins, of the Burlington, have signed a contract for the construction of a union depot at Omaha to cost \$1,500,000.

The navy yard north of the forty-second parallel of north latitude, on the coast of Oregon, is to be located in Puget Sound, opposite the thriving town of Seattle, where coal and lumber are abundant.

## Legal Decisions

### ATTACHMENT OF GOODS ON STORAGE FOR LIENS ON WAREHOUSE.

H., a sheriff, had placed in his hands a writ of attachment against the goods in the stores of the Garden City Warehouse Company, to secure to the attaching creditor the storage charges on the goods, the company having liens thereon. These storage rates were collected by H., but he paid them over to the debtor, on the ground that he could not make a lawful levy on them, as they were not subject to attachment. The creditor then sued the sheriff for the amount of the charges collected—*First National Bank of Chicago vs. Hanchett*—but was defeated, and an appeal was taken to the Supreme Court of Illinois, where the judgment was reversed. The Chief Justice, Sheldon, in the opinion said: "Conceding that the goods in the warehouse were not subject to attachment for the debts of the warehouse company, we are of the opinion that there was a dereliction of official duty on the part of the sheriff with respect to the storage collected. This money, so paid to him by the owners of the goods, was not his money; it was the money of the attachment debtor. It was paid to the sheriff on account of the debtor, and was received for his account. The officer was commanded by the statute to attach the money of the attachment debtor, and this money of the debtor we think he should have attached or have held the same as attached. If this money in the sheriff's hands was not strictly property of the warehouse company, which could not be seized in attachment, it might have been held and brought into court by the sheriff to answer to the judgment in attachment, as the court might direct. This certainly would be in the spirit of the attachment, with reference to the appropriation of credits on attachment, which directs that credits shall be attached, and this court has said that the attachment act shall be liberally construed. Had the sheriff held the money subject to the order of the court all would have been well, but he did not hold it. He did not obey the instructions of the attaching creditor, whose official agent he was, and he cannot justify his course by assuming the power of the court in determining to whom the money collected belonged. He is liable for the amount of the storage charges collected, and he must pay them over to the plaintiff."

### TRADE ASSOCIATIONS.

D. was a member of the New York Stock Exchange, and becoming insolvent he was suspended by its Governing Committee, who determined that his failure was caused by doing business in a reckless and unbusiness-like manner. It was resolved by the committee that D. was ineligible for readmission, and the exchange, pursuant to its constitution and by-laws, disposed of his membership and seat for \$25,000, and refused to pay it over to B., to whom D. had assigned the seat. The creditors of D. in the exchange claimed the proceeds of the seat under the rules of the exchange, and they were distributed among them. B. sued the president of the exchange for the proceeds of the seat, and the answer was set up that under the constitution and by-laws of the exchange the proceeds had been duly distributed among D.'s creditors in the exchange. B. in reply asked judgment in his favor on the ground that the answer was not a sufficient defense, but the court decided against him, and he carried the case—*Belton vs. Hatch*—to the Court of Appeals of New York, where he was again defeated. Judge Gray in the opinion said: "The judgment must stand. The New York

Stock Exchange is a voluntary association; it is not a partnership. It may be said, however, that the rights of the associates are not substantially different from those of partners so far as their rights in the property of the association are concerned. The interest of each member in the property of the association is equal, but it is subject to the constitution and by-laws, which are the basis on which is founded the association. They express the contract by which each member has consented to be bound, and which measures his duties, rights and privileges as such. It seems most clear to me that this constitution and by-laws derive a binding force from the fact that they are signed by all of the members, and that they are conclusive upon each of them in respect of the regulations of the mode of transaction of his business and of his right to continue to be a member. Whatever are the rights acquired by a member and created by his admission to membership, the rules by which the membership is created or dissolved and which control the officers of the organization, and the relations of the members entered into those rights when created and remained a part of them. There is nothing in this against public policy, for the reason that whatever the member acquires is subject to the self-imposed condition that his title and the rights which accrue from his membership are regulated by and are dependent upon the laws adopted by the association, and expressly consented to by him when he joined. If the constitution which forms the basis of this association appropriates to his creditors in the association or to any of its corporate objects the peculiar property of the member who, by force of constitutional provisions, has lost his membership, that was an incident entering into his title in it. D. must be held to his contract, and B. took no greater rights by the assignment."

### CONTRACT IN RESTRAINT OF TRADE.

N. sold sand, and he refused to sell a piece of land in which there was a deposit of sand on the ground that it would interfere with his business by enabling the purchaser to sell sand in competition with him. But at last he agreed to let the land go on the condition that it should be stipulated in the deed by a warranty that the grantee should "not sell any sand off the said premises." The deed was so made, but the person to whom this land was subsequently sold, claiming that this covenant did not run with the land, sold sand dug from the lot. N.'s executor then brought suit to restrain the last owner, S., from selling this sand, but he was defeated, and he carried the action—*Hodge vs. Sloan*—to the Court of Appeals of New York, where he had the judgment reversed. Judge Danforth, in the opinion, said: "The defendant insists that this covenant is in restraint of trade, and the court below has sustained this view. This conclusion is against our ideas of natural justice, for it takes from one party an advantage which he refused to sell, and secures to the other, without price, a privilege which his grantor was unable to buy. Nor do we think that this denial of private right is required by any rule of public policy. If we assume with defendant that the covenant is in restraint of trade, still it is valid if it imposes no restriction upon one party which is not beneficial to the other, and was induced by a consideration which made it reasonable for the parties to enter into it, or in other words, if it was a proper and useful contract or such as could not be disregarded without injury to a fair contractor."

The future lumber supply of the United States will, according to Gov. Russell Alger, be solved by the Nicaragua

Canal project. The Michigan and Wisconsin pine lands are being rapidly denuded, and but for the high freights by rail the Eastern market would even now be supplied from Washington Territory, where the forests abound in fir of a superior quality as Mr. Alger learns from personal observation. He says: "I think I am a fair judge of timber and I don't hesitate in pronouncing the product of these regions in every way superior to our Northern pine, and other countries recognize the fact. While I was in Tacoma I saw nine vessels, bound for England, Germany and China, loading at the wharves. I know that at the present time," he continued, "it cannot be profitably carried East by rail, because I have figured the matter with the roads touching that district, and it has been found impossible to carry the stuff 2000 miles at anything like a reasonable rate. If the canal is ever built, an enormous lumber traffic by water will surely spring up, and it will possibly come just at the time we need it most."

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# CURRENT HARDWARE PRICES.

APRIL 29, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.

Caps, Percussion, No. 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	55¢
E. B. Grnd. Edge, Cent. Fire	25¢
1-10's, 70's	75¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	50¢
G. D.	28¢
S. B.	30¢

Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	25¢
Cent. Fire Ground	70¢
Dbl. Waterproof, in 1-10's	1.40
Dbl. Waterproof, in 1-10's	1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	1.60

Cartridges.	
Rim Fire Cartridges	50¢
Rim Fire Military	15¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	15¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., 1.75	2¢
Blank Cartridges, 32 cal., 3.50	2¢
Primed Shells and Bullets	15¢
B. B. Caps, Round Ball, 1.75	2¢
B. B. Caps, Con. Ball, Swgd., 2.00	2¢

Primers	
Berdan Primers, 1.00	2¢
B. L. Caps (for Sturtevant Shells) 1.00	2¢
All other Primers, 1.20	2¢

Shells	
First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge (10 list)	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	33¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Seibold's Comb. Shot Shells	15¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢
I. X. L. 10 and 12 gauge	40¢
"Special," 16 gauge	30¢
"Special," 10 and 12 gauge	40¢
Fowler's Pat.	35¢

Shells Loaded—	
A. M. Co. List No. 19, 1887	20¢
U. M. C. & W. R. A.—B. E., 11 up, 2.00	
U. M. C. & W. R. A.—B. E., 10 up, 2.30	
U. M. C. & W. R. A.—B. E., 7.28	2.60
U. M. C. & W. R. A.—P. E., 11 up, 3.10	
U. M. C. & W. R. A.—P. E., 10 up, 4.00	
U. M. C. & W. R. A.—P. E., 7.28	4.90
Eley's E. B., 11 up	1.75
Eley's P. E., 11 up	2.80

Anvils	
Eagle Anvil, 10" x 14"	20¢
Peter Wright's	9¢
Armstrong's Mouse Hole	84¢
Armstrong's Mouse Hole, Extra 11"	11¢
Trenton	9¢
Wilkinson's	9¢
J. & Riley Carr, Pat. Solid	11¢
Moore & Barnes Mfg. Co.	83¢

Anvil Vise and Drill	
Millers Falls Co., 1.00	20¢
Cheney Anvil and Vise	25¢
Allen Anvil and Vise	40¢

Apple Parers—	
Advance	5¢
Antrim Combination	5¢
Baldwin	5¢
Champion	7.25
Eureka, 1888	17.00
Family Bay State	12.00
Gem	5.25
Gold Medal	4.00
Hudson's New 88	4.00
Ideal	4.75
Improved Bay State	30.00
Little Star	5.00
Monarch	13.50
New Lightning	5.00
Orion	4.50
Penn.	4.00
Perfection	4.00
Pomona	4.00
Rocking Table	6.00
Turntable	4.50
Victor	13.50
Waverly	4.50
White Mountain	4.00
72	4.25
76	5.75
78	6.50

Augers and Bits—	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	
Humphreysville Mfg. Co.	70¢
French, Swift & Co. (F. H. Beecher)	
Cook's, Douglas Mfg. Co.	55¢
Cook's, N. H. Copper Co.	50¢
Ives' Circular Lip	30¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	40¢
Up	40¢
C. E. Jennings & Co., No. 30	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 32 1/4 quaters, No. 5, 35; No. 30, 35.50	20¢
Lewis' Patent Single Twist	45¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢
Pugh's Black	20¢
Car Bits	50¢
L. Hommedieu Car Bits	18¢
Forstner Pat. Aug. Bits	10¢

## Hollow Augers—

Ives'	
French, Swift & Co.	25¢
Douglas'	25¢
Bonney's Adjustable, 1/2 doz \$48	40¢
Stearns'	20¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢

## Expansive Bits—

Clark's small, 18; large, 22	35¢
Ives' No. 4, 1/2 doz \$50	40¢
Swan's, No. 1, 22; No. 2, 22	40¢
Stearns' No. 2, 24	20¢

## Gimlet Bits—

Common	25¢
Diamond	25¢
Bee	25¢
Double Cut, Shephardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, 1/2 gro.	35¢
Double Cut, Douglas'	40¢
Double Cut, Ives'	60¢

## Bit Stock Drills—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

## Ship Augers and Bits—

L'Hommiedieu's	15¢
Watrous'	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

## Awl Hafts—

Sewing, Brass Fer. 1/2 gr, 3.50	45¢
Pat. Sewing, Short, 1.00 1/2 doz	40¢
Pat. Sewing, Long	1.30
Pat. Peg, Plain Top, 1/2 gr \$12.00	45¢
Pat. Peg, Leather Top, 1/2 gr \$12.00	45¢

## Awls, Brad Sets, &c—

Awls, Sewing, Common 1/2 gr \$1.70	35¢
Awls, Should. Peg 1/2 gr \$2.45	40¢
Awls, Pat. Peg 1/2 gr 63¢	40¢
Awls, Shouldered Brad 1/2 gr 35¢	
Awls, Handled Brad 1/2 gr 45¢	
Awls, Handled Scratch 1/2 gr 7.50	35¢
Awls, Socket Scratch 1/2 doz, 1.50	25¢

## Awl and Tool Sets—

Alken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00	55¢
Frax's Ad. Tool Hds., No. 1, 1 1/2; 2, 1 1/2; 3, 1 1/2; 4, 1 1/2	25¢
Miller's Falls Ad. Tool Hds., No. 1, 1 1/2; 2, 1 1/2; 3, 1 1/2; 4, 1 1/2	25¢
Henry's Combination Haft 1/2 doz \$6.50	
Brad Sets, No. 42, 110.50; No. 48, 112.50	70¢
Stanley's Excelsior, No. 1, 1.75; No. 2, 1.40; No. 3, 1.50	30¢

## Axes—

### Makers' and Special Brands—

First quality	5¢
Others	5.50

## Axle Grease—

Fraser's, in boxes, 1/2 doz \$4.75	
Dixon's Everlasting, in boxes, 1/2 doz \$4.75	
Dixon's Everlasting, 10-lb pails, ea. 55¢	
Lower grades, special brands	5¢

## Axles—

No. 1	4¢
No. 2 to 14	5.5¢
No. 15 to 18	47¢
No. 19 to 22	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5)	38¢
Over 10 sets	38¢

## Bag Holders—

Sprengle's Pat.	18¢
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## Balances—

Spring Balances	50¢
Common 24-lb	1.50
Chadillon's Spring Balances	50¢
Chadillon's Circular Spring Balances	60¢

## Bells—

### Hand—

Light Brass	70¢
Extra Heavy	80¢
Silver Chime	38¢
Globe (Cone's Patent)	25¢

### Door—

Gong, Abbe's	39¢
Gong, Yankee	45¢
Gong, Barton's	40¢
Gong, Taylor's	25¢
Crant, Brooks'	50¢
Crant, Cone's	10¢

Crant, Connel's	20¢
Lever, Sargent's	60¢
Lever, Taylor's Bronzed or Plated, net	25¢
Lever, R. E. M. Co's	50¢
Pull, Brook's	50¢
Pull, Western	25¢

## Cow—

Common Wrought	60¢
Western	20¢
Western, Sargent's list	70¢
Kentucky, "Star"	30¢
Kentucky, Sargent's list	70¢
Dodge, Genuine Kentucky	70¢
Texas Star	50¢
Call	40¢
Farm Bells	3¢
Steel Alloy Church and School Bells	40¢

## Bellows—

Blacksmiths'	50¢
Molders	40¢
Hand Bellows	40¢

## Belting, Rubber—

Common Standard	70¢
Standard	70¢
Extra	60¢
N. Y. B. & P. Co., Carbon	60¢
N. Y. B. & P. Co., Diamond	50¢

## Bench Steps—

Morrill's	50¢
Hotchkiss's	50¢
Weston's, No. 1, 110; No. 2, 110	10¢
McGill's	10¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension, Barber's 1/2 doz \$15.00	40¢
Iverson's 1/2 doz \$20.00	60¢
Diagonal 1/2 doz \$24.00	40¢
Angular 1/2 doz \$24.00	40¢

## Blind Adjusters—

Domestic	50¢
Excelsior	50¢
Washburn's Self-Locking	30¢

## Blind Fasteners—

Mackrell's, 1/2 doz, 1.00	20¢
Van Sand's Screw Pat., 15¢ 1/2 gr	60¢
Van Sand's Old Pat., 15¢ 1/2 gr	55¢
Washburn's Old Pattern, 1/2 gr	60¢
Merriman's	60¢
Austin & Eddy No. 2008, 1/2 gr	60¢
Security Gravity, 1/2 gr	60¢

## Blind Staples—

Barbed, 1/4 in. and larger	7¢
Barbed, 1/2 in. and larger	8¢

## Blocks—

Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

## Bolts—

### Door and Shutter—

Cast Iron Barrel, Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	65¢
Ives' Patent Door Bolts	60¢
Wrought Barrel	70¢
Wrought Square	70¢
Wt. Shutter, all iron, Stanley's	60¢
Wt. Shutter, Brass Knob	40¢
Wt. Shutter, Sargent's list	60¢
Wt. Sunk Flush, Sargent's list	55¢
Wt. Sunk Flush, Stanley's list	50¢
Wt. B.K. Flush, Com'n	55¢

### Carriage, Machine, &c.—

Com. list June 10, '84	75¢
Genuine Eagle, list Oct. '84	75¢
Phila. pattern, list Oct. 7, '84	75¢
R.E.W., old list	70¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢

## Tire—

Common, list Feb. 28, '83	70¢
Port Chester Bolt and Nut Company	70¢
Empire, list Feb. 28, '83	70¢
Phila., list Oct. '84	82¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢
American Screw Company	75¢
Norway, Phila., list Oct. 18, '84	75¢
Eagle, Phila., list Oct. 18, '84	80¢
Phila., list Oct. 18, '84	82¢
Bay State, list Feb. 28, '83	70¢
R.E.W., Philadel., list Oct. 18, '84	82¢

## Stove and Plow—

Stove	65¢
Plow	60¢
R. B. & W., Plow	60¢

## Borax—

Borax	9¢
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## Boring Machines—

Without Augers	50¢
Douglas	55¢
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Machines	2.35
Phillips' Patent with Augers	7.00

## Bow Pins—

Humason, Beckley & Co's	60¢
Sargent & Co's	17¢
Peck, Stow & W. Co.	50¢

## Braces—

Barber's	
Nos. 10 to 16	50¢
Nos. 30 to 33	50¢
Nos. 40 to 63	50¢
Barker's	
Nos. 8, 10 and 12	75¢
Plated, Nos. 8, 10 and 12	65¢
Osgood's Ratchet	40¢
Spofford's	50¢
Ives' New Haven Novelty	70¢
New Haven Ratchet	60¢
Barber Ratchet	60¢
Barbers	60¢
Spofford	60¢
Common Ball, American	1.10
Bartholomew's	50¢
Nos. 25, 27 and 30	50¢
Nos. 117, 118, 119	70¢
Amidon's	
Barker's Imp'd Plain	75¢
Barker's Imp. Nickeled	55¢
Ratchet	75¢
Eclipse Ratchet	50¢
Globe Jawed	40¢
Corner Brace	40¢
Universal, 3 in., 2.10; 10 in.	3.25
Buffalo Ball	1.10
P. S. & W.	50¢

## Brackets—

Shelf plain, Sargent's list	55¢
Shelf, fancy, Sargent's list	60¢
Reading, plain	50¢
Reading, Rosette	60¢
Bright Wire Goods	85¢

## Broilers—

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Cross-Cut Saw Handles—  
Atkins No. 1 Loop, pair, 30¢; No. 3,  
22¢; No. 2 and No. 4 Reversible, 22¢.  
Boynton's Loop Saw Handles, 50¢... 60¢  
Champion..... 15¢

## Hangers—

Barn Door, old patterns, 60¢10¢10¢70¢  
Barn Door, New England, 60¢10¢10¢70¢  
Samson Steel Anti-Friction..... 55¢  
Orleans Steel..... 55¢  
Hamilton Wrought Wood Track..... 55¢  
U. S. Wood Track..... 55¢  
Champion..... 60¢10¢  
Rider and Wooster, Medina Y. G. Co.'s  
List..... 70¢  
Climax Anti-Friction..... 60¢  
Lancaster Anti-Friction for Wood Track..... 55¢  
Zenith for Wood Track..... 55¢  
Reed's Steel Arm..... 55¢  
Challenge, Barn Door..... 50¢  
Sterling's Improved (Anti-Friction) 65¢10¢  
Victor, No. 1, \$15.00; No. 2, \$16.50; No.  
3, \$18.00..... 60¢2¢  
Cheritree..... 50¢10¢  
Kiddie's..... 50¢10¢60¢  
The Boss..... 60¢10¢  
Best Anti-Friction..... 60¢10¢  
Duplex (Wood Track)..... 60¢10¢5¢  
Terry's Pat., 7/8 doz pr. 4 in, \$10.00; 5 in,  
\$12.00..... 50¢6¢50¢10¢  
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40;  
No. 6, \$18.00..... 50¢15¢60¢  
Wood Track Iron Clad, 7/8 ft. 10¢..... 15¢60¢  
Carrier Steel Anti-Friction..... 50¢50¢5¢  
Architect, 7/8 set \$6.00..... 20¢  
Eclipse..... 20¢10¢  
Felix, 7/8 set \$4.50..... 20¢  
Richards..... 30¢30¢10¢  
Lane's Steel Anti-Friction..... 40¢10¢  
Ball Bearing Door Hanger, 20¢10¢25¢10¢  
Warner's Pat..... 20¢20¢10¢  
Stearns' Anti-Friction..... 20¢20¢10¢  
Stearns' Challenge..... 25¢10¢25¢10¢10¢  
Faulstich..... 40¢40¢5¢  
American, 7/8 set \$6.00..... 20¢10¢  
Rider & Wooster, No. 1, 62¢; No. 2,  
75¢..... 40¢10¢  
Paragon, Nos. 1, 2 and 3..... 40¢10¢  
Paragon, Nos. 5, 6, 7 and 8..... 20¢10¢  
Crescent..... 60¢60¢10¢  
Nickel Cast Iron..... 50¢  
Nickel Malleable Iron and Steel..... 40¢  
Scranton Anti-Friction Single Strap, 35¢  
Scranton Anti-Friction Double Strap, 40¢  
Universal Anti-Friction..... 40¢  
Wild West, 4 in. Wheel, \$15.00; 5 in.  
Wheel, \$21.00..... 45¢  
Star..... 40¢10¢40¢10¢5¢  
May..... 50¢25¢50¢10¢  
Barry, \$6.00..... 40¢10¢

## Harness Snaps—

## See Snaps.

## Hatchets—

List Jan. 1, 1888..... 35¢40¢  
Isaiah Blood..... 40¢5¢  
Hunt's Shingling, Lath and Claw..... 40¢5¢  
Hunt's Broad..... 40¢10¢50¢  
Buffalo Hammer Co..... 40¢10¢50¢  
Hurd's..... 40¢10¢50¢  
Fayette R. Plumb..... 40¢10¢50¢  
Wm. Mann, Jr., & Co..... 50¢50¢5¢  
Underhill Edge Tool Co..... 40¢50¢40¢10¢  
Underhill's, Haines and Bright..... 35¢  
C. Hammond & Son..... 40¢10¢50¢  
Simmons..... 40¢10¢50¢  
Peck's..... 40¢10¢50¢  
Kelly's..... 50¢50¢5¢  
Sargent & Co..... 50¢  
Ten Eyck Edge Tool Co. 40¢10¢40¢10¢5¢  
Collins..... 10¢  
Schulte, Loboff & Co..... 50¢50¢5¢

## Hay and Straw Knives—

Lighting, Mfrs. price 7/8 doz \$18.00, 25¢  
But jobbers frequently give extras.  
Gem..... 40¢7/8 doz \$10  
Wadsworth's..... 40¢7/8 doz \$10  
Carter's Needle..... 7/8 doz \$11.50 \$12.00  
Heath's..... 7/8 doz \$13.50 \$14.00  
Auburn Hay, Com. and Spear Point..... 50¢  
Auburn, Straw..... 50¢  
Nolin's Hay..... 7/8 doz \$10.00

## Hinges—

Wrought Iron Hinges  
Strap and T..... 75¢5¢75¢10¢  
Screw Hook and Strap..... 6 to 12 in., 7/8 doz 34¢  
Strap..... 14 to 20 in., 7/8 doz 34¢  
Heavy Welded Hook..... 6 to 12 in., 7/8 doz 34¢  
Hook..... 14 to 20 in., 7/8 doz 34¢  
Screw Hook..... 14 in., 7/8 doz \$1.50  
and Eye..... 14 in., 7/8 doz \$2.45 10¢  
Rolled Blind Hinges, Nos. 32 and 34..... 60¢10¢  
Rolled Blind Hinges, Nos. 232 and 234..... 55¢10¢  
Rolled Plate..... 70¢10¢  
Rolled Raised..... 70¢10¢  
Plate Hinges 8, 10 & 12 in., 7/8 doz 5¢  
"Providence" over 12 in., 7/8 doz 45¢  
Spring Hinges  
Geer's Spring and Blank Butts..... 40¢  
Union Spring Hinge Co.'s List, March,  
1888..... 20¢  
Acme and U. S..... 20¢  
Empire and Crown..... 20¢  
Hero and Monarch..... 50¢  
American, Gem, and Star, Japaned..... 20¢  
American, Gem, and Star, Bronzed..... net  
Oxford, Bronze and Brass..... net  
Barker's Double Acting..... 20¢10¢  
Union Mfg. Co..... 25¢  
Bommer's..... 30¢  
Buckman's..... 15¢20¢  
Chicago..... 30¢  
Wiles..... 40¢  
Devore's..... 10¢  
Rex..... 40¢  
Royal..... 60¢  
Reliable..... 60¢  
Champion..... 60¢

## Gate Hinges—

Wester..... 7/8 doz \$4.40, 60¢  
N. E..... 7/8 doz \$7.00, 55¢  
N. E. Reversible..... 7/8 doz \$5.20, 55¢10¢  
Clark's, Nos. 1, 2, 3..... 60¢10¢5¢  
N. Y. State..... 7/8 doz \$5.00, 55¢10¢  
Automatic..... 7/8 doz \$12.50, 50¢  
Common Sense..... 7/8 doz pair \$4.50, 50¢  
Seymour..... 45¢10¢  
Shepard's..... 60¢10¢5¢  
Reed's Latch and Hinges..... 7/8 doz \$12.00,  
50¢

## Blind Hinges—

Parker..... 75¢2¢  
Palmer..... 50¢50¢5¢  
Seymour..... 75¢  
Nicholson..... 45¢10¢  
Huffer..... 50¢

Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢5¢90¢  
Clark's Mortise Gravity..... 60¢  
Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢55¢10¢5¢  
Sargent's, No. 12..... 77¢10¢10¢  
Reading's Gravity..... 75¢10¢75¢10¢5¢  
Shepard's..... 75¢10¢55¢10¢5¢  
Noiseless..... 75¢10¢55¢  
Niagara..... 80¢2¢3¢  
Buffalo..... 80¢2¢3¢  
Clark's Genuine Pat..... 80¢2¢3¢  
O. S., Lull & Porter..... 75¢10¢  
Acme, Lull & Porter..... 75¢10¢  
Queen City Reversible..... 75¢  
Clark's Lull & Porter, Nos. 0, 1, 15¢  
2, 2 1/2, 3..... 75¢10¢2¢3¢  
North's Automatic Blind Fixtures, No.  
2, for Wood, \$10.50; No. 3, for Brick,  
\$13.50..... 25¢2¢

## Hoes—

## Handled—

Garden, Mortar, &c..... 65¢  
Planter's, Cotton, &c..... 65¢  
Warren Hoe..... 60¢  
Magic..... 7/8 doz \$4.00

## Eye—

D. & H. Scovill..... 20¢  
Lane's Crescent Planter Pattern..... 45¢  
Lane's Razor Blade, Scovill Pattern..... 30¢  
Maynard, S. & O. Pat..... 45¢5¢  
Sandusky Tool Co., S. & O. Pat..... 60¢  
Hubbard & Co., S. & O. Pat..... 60¢  
Chattanooga Tool Co., S. & O. Pat..... 60¢  
Grub..... 60¢60¢10¢

## Hog Rings and Ringers—

Hill's Improved Ringers..... 7/8 doz \$4.25  
Hill's Old Style Ringers..... 7/8 doz \$2.75  
Hill's Tongues..... 7/8 doz \$4.50  
Hill's Rings..... 7/8 doz bxs \$2.15 \$2.25  
Perfect Ringers..... 7/8 doz bxs \$1.00 \$1.70  
Perfect Ringers..... 7/8 doz \$2.15 \$2.25  
Blair's Hog Ringers..... 7/8 doz \$2.25 \$2.50  
Blair's Hog Ringers..... 7/8 doz 90¢ \$1.00  
Champion Ringers..... 7/8 doz \$2.00  
Champion Rings, Double..... 7/8 doz \$2.25  
Brown's Ringers..... 7/8 doz \$2.00  
Brown's Rings..... 7/8 doz \$1.25 \$1.30

## Hoisting Apparatus—

Moore's Hand Hoist, with Lock..... 20¢  
Brake..... 20¢  
Moore's Differential Pulley Block..... 40¢  
Energy Mfg. Co.'s..... 25¢

## Holders, File and Tool—

Bals Pat..... 7/8 doz \$4.00, 25¢  
Nicholson File Holders..... 20¢

## Hollow-Ware—

Stove Hollow-Ware—  
Ground..... 60¢60¢5¢  
Ungrind..... 60¢10¢60¢10¢10¢  
Enameled Hollow-Ware—  
Maslin Kettles..... 55¢10¢  
Boilers and Saucepans..... 40¢5¢  
Tinned Boilers and Saucepans..... 40¢  
Gay Enameled-Ware—  
Stove..... 50¢50¢5¢  
Maslin Kettles..... 60¢10¢60¢10¢10¢  
Boilers and Saucepans..... 40¢5¢  
Agate and Granite Ware, old list..... 25¢  
Rustless Hollow-Ware..... 50¢50¢5¢  
Galvanized Tea-Kettles—  
Inch..... 6 7 8 9  
Each..... 55¢ 60¢ 65¢ 75¢

## Silver Plated—

4 mo. or 5¢ cash in 30 days.  
Reed & Barton..... 40¢5¢  
Meriden Britannia Co..... 40¢5¢  
Simpson, Hall, Miller & Co..... 40¢5¢  
Rogers & Brother..... 40¢5¢  
Hartford Silver Plate Co..... 40¢5¢  
William Rogers Mfg. Co..... 40¢5¢5¢

## Hooke—

## Cast Iron—

Bird Cage, Sargent's list..... 60¢10¢10¢  
Bird Cage, Reading..... 60¢10¢10¢  
Clothes Line, Sargent's list..... 60¢10¢10¢  
Clothes Line, Reading list..... 60¢10¢10¢  
Ceiling, Sargent's list..... 55¢10¢10¢  
Harness, Reading list..... 55¢10¢10¢  
Coat and Hat, Sargent's list..... 55¢10¢60¢10¢  
Coat and Hat, Reading..... 50¢10¢60¢10¢10¢

## Wrought Iron—

Cotton..... 7/8 doz \$1.25  
Cotton Pat. (N. Y. Mallet & Handle Wks.)..... 30¢  
Tassel and Picture (T. & S. Mfg. Co.)..... 30¢  
Wrought Staples, Hooks, &c..... See Wrought Goods.

## Wire—

Wire Coat and Hat, Gem, list April,  
1886..... 45¢  
Wire Coat and Hat, Miles', list April,  
1886..... 45¢  
Indestructible Coat and Hat..... 45¢  
Wire Coat and Hat, Standard..... 45¢  
Belt..... 75¢10¢80¢

## Miscellaneous—

Grass, No. 2, \$2.00; No. 3, \$2.35; No. 4, \$2.50  
Nolin's Grass..... 7/8 doz \$3.25  
Bush..... 55¢60¢  
Whitcomb-Patent..... 55¢  
Hooks and Eyes—Malleable Iron..... 70¢70¢10¢  
Hooks and Eyes—Brass..... 80¢10¢10¢  
Fish Hooks, American..... 50¢  
Bench Hooks..... See Bench Stops.

## Horse Nails—

Nos. 6 7 8 9 10  
Ausable..... 28¢ 26¢ 24¢ 22¢ 20¢  
Clinton, Fin..... 24¢ 22¢ 21¢ 20¢ 19¢  
Essex..... 28¢ 26¢ 24¢ 22¢ 20¢  
Lyra..... 25¢ 23¢ 22¢ 21¢ 20¢  
Snowden..... 25¢ 23¢ 22¢ 21¢ 20¢  
Putnam..... 23¢ 21¢ 20¢ 19¢ 18¢  
Vulcan..... 23¢ 21¢ 20¢ 19¢ 18¢  
Northwest..... 25¢ 23¢ 22¢ 21¢ 20¢  
Globe..... 23¢ 21¢ 20¢ 19¢ 18¢  
Boston..... 23¢ 21¢ 20¢ 19¢ 18¢  
A. C..... 25¢ 23¢ 22¢ 21¢ 20¢  
C. B.-K..... 25¢ 23¢ 22¢ 21¢ 20¢  
Champlain..... 28¢ 26¢ 24¢ 22¢ 20¢

New Haven..... 28¢ 26¢ 24¢ 22¢ 20¢  
Saranac..... 23¢ 21¢ 20¢ 19¢ 18¢  
Champion..... 25¢ 23¢ 22¢ 21¢ 20¢  
Capewell..... 28¢ 26¢ 24¢ 22¢ 20¢  
Star..... 23¢ 21¢ 20¢ 19¢ 18¢  
Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢  
Western..... 23¢ 21¢ 20¢ 19¢ 18¢  
Empire Bronzed..... 14¢  
Horse Shoes—See Shoes Horse.

## Hose, Rubber—

Competition..... 75¢10¢75¢10¢5¢  
Standard..... 70¢70¢10¢  
Extra..... 60¢60¢10¢  
N. Y. B. & P. Co., Para..... 30¢10¢  
N. Y. B. & P. Co., Extra..... 50¢  
N. Y. B. & P. Co., Dundee..... 60¢10¢5¢

## Huskers—

Blair's Adjustable..... 7/8 gr \$8.00  
Blair's Adjustable Clipper..... 7/8 gr 7.00

## Indurated Fiber-Ware.

Spittones, No. 2, 7/8 doz..... \$6.75  
Bastins, Ringed, 7/8 doz, No. 1, \$3.70;  
No. 2, \$3.10; No. 3..... \$2.70  
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4  
pieces), 7/8 doz nests..... \$16.87  
Keelers, Nested, Nos. 1, 2, 3 and 4 (4  
pieces), 7/8 doz nests..... \$8.37  
Butter Bowls, 15, 17 and 19-inch (3  
pieces), 7/8 doz nests..... \$6.75  
Liquid Measures, pt., qt., 2 qt. and fun-  
nell (4 pieces), 7/8 set..... \$3.00  
Dry Measures, 1, 2, 4, 8 and 16 qts. (6  
pieces), 7/8 set..... \$2.25  
See also Pails.

## Jack Screws—See Screws.

Kettles— Spun, Stamped.  
Brass, 7 to 17 in., 7/8 doz..... 24¢ 21¢  
Brass larger than 17 in., 20¢ 23¢  
Enameled and Tea Kettles..... See Hollow-Ware.

## Keys—

Lock Ass'n list Dec. 30, 1888..... 50¢10¢  
Eagle, Cabinet, &c..... 60¢5¢  
Hotchkiss' Brass Blanks..... 40¢  
Hotchkiss, Copper and Tinned..... 40¢  
Hotchkiss' Pad, and Cab..... 35¢  
Romer's Nos. 0 to 91..... 7/8 doz \$4.00, 15¢  
Wollensak Tuned..... 50¢10¢

## Knife Sharpeners—

Parkin's..... Applewood Handles..... 7/8 doz \$6.00, 40¢  
Rosewood or Cocobolo..... 7/8 doz \$9.00, 40¢

## Knives—

Wilson's Butcher Knives..... 25¢30¢  
Ames' Butcher Knives..... 25¢  
Foster Bros' Butcher, &c..... 40¢40¢  
Nichols' Butcher Knives..... 40¢10¢  
Ames' Shoe Knives..... 20¢25¢  
Ames' Bread Knives..... 7/8 doz \$1.50, 15¢20¢  
Moran's Shoe and Bread..... 20¢  
Hay and Straw..... See Hay Knives.  
Table and Pocket..... See Cutlery.  
Corn, Auburn Mfg. Co. Western Pat..... 23.00  
Corn, Auburn Mfg. Co. Crescent..... \$3.50

## Knobs—

Door Mineral..... 65¢65¢  
Door Por. Jap'd..... 75¢75¢  
Door Por. Nickel..... 32.00 \$2.25  
Door Por. Plated Nickel..... 32.00 \$2.25  
Drawer, Porcelain..... 60¢10¢60¢10¢10¢  
Hemacite Door Knobs..... 40¢10¢50¢  
Yale & Towne Wood, list Dec., 1888..... 40¢  
Furniture Plain..... 75¢ gro 10¢  
Furniture Wood Screws..... 25¢10¢  
Base, Rubber Tip..... 70¢10¢5¢  
Picture, Sargent's..... 60¢10¢10¢70¢  
Picture, Sargent's..... 70¢10¢  
Picture, Hemacite..... 35¢5¢  
Shutter, Porcelain..... 65¢10¢  
Carriage, Jap..... 7/8 gro 80¢, 60¢10¢

## Ladles—

Melting, Sargent's..... 55¢10¢  
Melting, Reading..... 35¢10¢  
Melting, Monroe's Pat..... 7/8 doz \$4.00, 40¢  
Melting, P. S. & W..... 35¢10¢40¢  
Melting, Warner's..... 30¢

## Lawn Mowers—

Standard List..... 50¢10¢  
Quaker City..... 60¢10¢  
Enterprise..... 60¢10¢

## Lanterns—

Tubular  
Plain with Guards, 7/8 doz..... \$4.00 \$4.35  
Lift Wire, with Guards..... \$4.50 \$4.75  
Square Plain, with Guards..... \$4.00 \$4.25  
Sq. Lift Wire, with Guards..... \$4.25 \$4.50  
Without Guards, 25¢ 7/8 doz less.

Police, Small, \$6.00; Medium, \$7.35;  
Large, \$9.75..... 30¢25¢

## Lemon Squeezers—

Porcelain Lined, No. 1..... 7/8 doz \$6.00,  
25¢30¢  
Wood No. 2..... 7/8 doz \$3.00, 35¢  
Wood, Common..... 7/8 doz \$1.70 \$1.75  
Dunlap's Improved..... 7/8 doz \$3.75, 20¢  
Samms..... No. 1, \$5.00; No. 2, \$3; 12,  
\$18 7/8 doz..... 25¢10¢  
Jennings' Star..... 7/8 doz \$2.50  
The Boss..... 7/8 doz \$2.50  
Dean's, Nos. 1, 7/8 doz \$6.50; 2, \$9.35; 3,  
\$11.00..... 30¢  
Little Giant..... 50¢50¢25¢  
King..... 40¢5¢

## Lines—

Cotton and Linen Fish, Draper's..... 50¢  
Draper's Chalk..... 60¢  
Draper's Mason's Linen, 84 ft., No. 1,  
\$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,  
\$2.75; No. 5, \$3.25..... 25¢  
Cotton Chalk..... 45¢  
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50;  
10¢  
Silver Lake, Braided, No. 0, \$6.00; No. 1,  
\$6.50; No. 2, \$7.00; No. 3, \$7.50 7/8  
gro..... 25¢  
Mason's Linen, No. 8 1/2, \$1.50; No. 4,  
\$2.00; No. 4 1/2, \$2.50..... 25¢  
Mason's Colored Cotton..... 45¢  
Wire Clothes..... Nos. 18 19 20  
\$3.00 \$3.00 \$2.50

Ventilator Cord, Samson Braided,  
White or Drab Cotton..... 7/8 doz \$7.50, 30¢

## Locks, &amp;c.—

Door Locks, Latches, &c.  
List Dec. 30, '88, chgd Feb. 2, '89..... 50¢10¢60¢10¢  
Mallory, Wheeler & Co., list July, '88..... 50¢10¢60¢10¢  
Sargent & Co., list Aug. 1, '88..... 50¢10¢60¢10¢  
Reading Hardware Co., list Feb. 2, '88..... 50¢10¢60¢10¢

Note.—Lower net prices often made.

Perkins' Burglar Proof..... 60¢25¢  
Plate..... 35¢25¢  
F. Many's "Extension Cylinder" \$10.50  
7/8 doz..... 55¢60¢10¢  
Barnes Mfg. Co..... 40¢40¢10¢  
Yale..... net prices  
Delta Flat Key..... 30¢  
L. & C. Round Key Latches..... 30¢10¢  
L. & C. Flat Key Latches..... 33¢40¢10¢  
Romer's Night Latches..... 15¢  
Shepardson or U. S..... 35¢  
Felter or American..... 40¢10¢  
Seed's N. Y. Hasp Lock..... 25¢

## Cabinets—

Eagle, Cardford Par..... list March, '84, rev.  
ker and Corbin..... Jan. 1, '85, 33¢45¢  
Deitz, Nos. 36 to 39..... 40¢  
Deitz, Nos. 51 to 63..... 40¢10¢  
Deitz, Nos. 86 to 96..... 30¢  
Stoddard Lock Co..... 30¢33¢45¢  
"Champion" Night Latches..... 40¢  
Barnes Mfg. Co..... 40¢40¢10¢  
Eagle and Corbin Trunk..... 25¢25¢  
"Champion" Cab. and Combin..... 33¢45¢  
Yale..... net prices  
Romer's..... 25¢

## Padlocks—

List Dec. 23, '84..... 75¢75¢10¢  
Yale Lock Mfg. Co.'s..... net prices  
Eagle..... 25¢25¢  
Bureka, Eagle Lock Co..... 40¢25¢  
Romer's Nos. 0 to 91..... 30¢  
Romer's Scandinavian, &c., Nos. 100 to  
506..... 15¢  
A. E. Deitz..... 40¢  
Champion Padlocks..... 40¢  
Hotchkiss..... 30¢  
Star..... 45¢  
Horseshoe..... 7/8 doz \$9. 40¢40¢10¢  
Barnes Mfg. Co..... 40¢40¢10¢  
Nock's..... 30¢  
Brown's Pat..... 25¢  
Scandinavian..... 30¢40¢10¢  
Fram's Pat. Scandinavian low list..... 60¢  
Ames Sword Co. up to No. 150..... 40¢  
Ames Sword Co. above No. 150..... 50¢

## Lumber Tools.

Ring Peavies, "Blue Line"..... 7/8 doz \$20.00  
Ring Peavies, Common..... 7/8 doz \$15.00  
Steel Socket Peavies..... 7/8 doz \$21.00  
Mail Iron Socket Peavies..... 7/8 doz \$19.00  
Cant Hooks, "Blue Line"..... 7/8 doz \$12.00  
Cant Hooks, Common Finish, 7/8 doz \$14.00  
Cant Hooks, Mail Socket Clasp, "Blue  
Line" Finish..... \$16.00  
Cant Hooks, Mail Socket Clasp, Com-  
mon Finish..... 7/8 doz \$14.50  
Cant Hooks, Clip Clasp, "Blue Line"  
Finish..... 7/8 doz \$14.00  
Cant Hooks, Clip Clasp, Common Fin-  
ish..... 7/8 doz \$12.00  
Hand Spikes..... 7/8 doz 6 ft., \$15.00; 5 ft.,  
\$13.00  
Pike Poles, Pike & Hook, 7/8 doz, 15 ft.,  
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;  
18 ft., \$17.50; 20 ft., \$21.50  
Pike Poles, Pike only, 7/8 doz, 12 ft.,  
\$10.00; 14 ft., \$11.00; 16 ft., \$12.00; 18  
ft., \$15.00; 20 ft., \$20.00.  
Pike Poles, not ironed, 7/8 doz, 12 ft.,  
\$6.00; 14 ft., \$7.00; 16 ft., \$8.00; 18  
ft., \$12.00; 20 ft., \$16.00.  
Setting Poles, 7/8 doz, 12 ft., \$14.00; 14  
ft., \$15.00; 16 ft., \$17.00  
Swamp Hooks..... 7/8 doz \$18.00

## Lustre—

Four-ounce Bottles..... 7/8 doz, \$1.75; 7/8  
gross..... \$17.00

## Mallets—

Hickory..... 30¢10¢30¢10¢10¢  
Lignumvitae..... 20¢10¢30¢10¢10¢  
B. & L. Block Co., Hickory & L. V..... 30¢30¢10¢

## Match Safes—

Dangerfield's Self-Igniting..... 7/8 doz \$1.50  
Mattecks, Regular list..... 60¢5¢60¢10¢

## Meat Cutters—

Dixon's 7/8 doz..... 40¢5¢  
Nos..... 1 2 3 4 5  
\$14.00 \$17.00 \$19.00 \$30.00  
Woodruff's 7/8 doz..... 40¢25¢  
Nos..... 100 150  
\$15.00 \$18.00  
Champion 7/8 doz..... 40¢45¢  
Nos..... 200 300 400  
\$22.00 \$27.00 \$40.00  
Hales Pattern 7/8 doz..... 70¢70¢5¢  
Nos..... 11 12 15  
\$27.00 \$33.00 \$45.00  
American..... 1 2 3 4 5  
Nos..... \$5 \$7 \$10 \$25 \$50 \$50  
Enterprise..... 30¢  
Nos..... 10 12 22 33 42  
Each..... \$3 \$2.50 \$4 \$5 \$15  
Pennsylvania..... 40¢10¢  
7/8 doz..... \$24.00 \$28.00 \$36.00 \$22.00  
Miles' Challenge 7/8 doz..... 45¢45¢10¢  
Nos..... 1 2 3  
\$22.00 \$30.00 \$40.00  
Home No. 1..... 7/8 doz, \$35.00, 55¢10¢  
Draw Cut, each:  
Nos..... 5 2 6 8  
\$50 \$75 \$80 \$225..... 20¢25¢  
Beef Shavers (Enterprise)..... 20¢10¢30¢  
Chadborn's Smoked Beef Cutter..... 7/8 doz  
\$36.00

## Mincing Knives—

Am. (2d quality), 7/8 gr, 1 blade, \$7; 2  
blades, \$12; 3 blades, \$15..... net  
Lothrop's..... 20¢10¢  
Smith's, 7/8 doz, Single, \$3.00; Double, \$3  
40¢45¢  
Knapp & Cowles..... 50¢10¢60¢  
Buffalo Adjustable..... 7/8 doz, \$3.00, 35¢

**Molasses Gates—**

Stebbin's Pat.	70¢@70¢1/2
Stebbin's Genuine	60¢@10¢10
Stebbin's Tinned Ends	40¢10
Chase's Hard Metal	50¢10
Bush's	20¢
Lincoln's Pattern	70¢@70¢10
Wood's	30¢10

Boes, # doz:  
Nos. 1, 57; No. 2, 38; No. 3, 39; No. 4, 40.  
\$10. 60¢10¢10

Money Drawers... # doz, \$18@22

Muzzles—

Safety... # doz, \$3.00, 25¢

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny... # doz, \$2.50

Nail Puller—

Curtiss Hammer... # doz \$9.00

Glant, No. 1... # doz, \$30.00, 10¢

Pelican... # doz, \$30.00, 25¢

Boes... # doz, \$30.00, 30¢

Lightning... # doz \$21.00

Nail Sets—

Square... # gr., \$4.00@4.25

Round... # gr., \$3.25

Cannon's Diamond Point... # gr., \$12, 20¢

**Nut Crackers—**

Table (H. & B. Mfg. Co.)... 40¢

Blake's Pattern... # doz \$3.00, 10¢

Turner & Seymour Mfg. Co... 50¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square, Hex.

Hot Pressed... 5¢ 5.9¢

Cold Punched... 5¢ 5.5¢

In lots less than 100 lb, #, add 1/4¢; 1-b.

boxes, add 1¢ to list.

**Oakum—**

Government... # lb 7¢ @ 8¢

U. S. Navy... # lb 6¢ @ 7¢

Navy... # lb 5¢ @ 6¢

**Oilers—**

Zinc and Tin... 65¢@65¢10
Brass and Copper	50¢10¢50¢10
Malleable, Hammers' Improved, No. 1.	\$3.00; No. 2, \$4.00; No. 3, \$4.40 # doz.
	10¢10¢10
Malleable, Hammers, Old Pattern, same	40¢
list	
Prior's Pat. or "Paragon" Zinc	60¢10¢10
Prior's Pat. or "Paragon" Zinc	50¢
Olmead's Tin and Zinc	60¢
Olmead's Brass and Copper	50¢
Broughton's Zinc	60¢
Broughton's Brass	50¢

**Packing, Steam—**

Rubber—

Standard... 60¢10¢60¢10
Extra	50¢10¢50¢
N. Y. B. & P. Co., Standard	50¢10¢50¢
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	55¢, 30¢
Jenkins' Standard	# lb 80¢, 35¢

**Miscellaneous—**

American Packing... 10¢@11¢ # lb

Russia Packing... 14¢ # lb

Italian Packing... 16¢ # lb

Cotton Packing... 15¢@17¢ # lb

Jute... 7¢@8¢ # lb

**Padlocks—**

See Locks.

**Pails—**

Galvanized Iron—

Quarts... 10 12 14

Hill's Light Weight, # doz. \$2.75 3.00 3.25

Hill's Heavy Weight, # ds. 3.00 3.25 3.75

Whiting's... 2.75 3.00 3.25

Sidney Shephard & Co... 2.80 3.00 3.40

Iron Clad... 2.75 3.00 3.25

Fire Buckets... 2.75 3.25 3.50

Buckets, see Well Buckets.

**Indurated Fibre Ware—**

Star Pails, 12 qt... # doz \$4.50

Fire, Stable and Milk, 14 qt... # doz \$5.85

**Pencils—**

Faber's Carpenters'... high list 50¢

Faber's Round Gilt... # gro \$5.25

Dixon's Lead... # gro \$4.50

Dixon's Lumber... # gro \$6.75

Dixon's Carpenters'... 40¢10

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;

6 to 7, \$13.00... 60¢50¢60¢10

**Picture Nails—**

Brass Head, Sargent's list... 50¢10¢10
Brass Head, Combination list	50¢10
Porcelain Head, Sargent's list	50¢10¢10
Porcelain Head, Combination list	40¢10
Niles' Patent	40¢

**Pinking Irons—**

# doz 65¢ net

**Pipe, Wrought Iron—**

List March 23, 1887.

1 1/2 and under, Plain... 55¢

1 1/2 and under, Galvanized... 47¢

1 1/2 and over, Plain... 67¢

1 1/2 and over, Galvanized... 55¢

Boiler Tubes, Iron.

1 1/2 and under... 57¢

2 in. to 2 1/2 in... 62¢

3 in. and larger... 65¢

**Planes and Plane Irons—**

Wood Planes—

Molding... 50¢50¢50¢10
Bench, First Quality	60¢60¢60¢
Bench, Second Quality	60¢10¢60¢10
Bailey's (Stanley R. & L. Co.)	40¢10

Iron Planes—

Bailey's (Stanley R. & L. Co.)... 40¢10
Miscellaneous Planes (Stanley R. & L. Co.)	20¢10
Victor Planes (Stanley R. & L. Co.)	20¢10
Steer's Iron Planes	35¢35¢55
Meriden Mal. Iron Co.'s	30¢10¢30¢10
Davis's Iron Planes	30¢10¢30¢10
Birmingham Plane Co.	50¢50¢50
Gage Tool Co.'s Self-Setting	30¢10
Chaplin's Iron Planes	40¢40¢55
Sargent's	30¢10¢30¢10

**Plane Irons—**

Plane Irons	20¢10
Plane Irons, Butcher's	\$5.00@5.25 to 2
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "This	40¢
Plane Irons, Auburn Tool Co., "This	40¢
Sandusky Tool Co.	30¢
Single and Cut...	30¢
Double	40¢
L. & I. J. White	25¢

**Pliers and Nippers—**

Button's Patent	30¢10¢40
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	\$21.00 # doz
Humason & Beckley Mfg. Co.	50¢50¢10
Gas Pliers, Cusstar's Nickel Plated	60¢55
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinnars' Cutting Nippers	add 5¢ dis 10
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel	# doz, \$12.00, 30¢55
Cronk's 8 in., \$15.00; 10 in. \$21.00	40¢40¢55

**Plumbs and Levels—**

Regular List	70¢10¢70¢10
Diaston's	45¢10
Pocket Levels	70¢10¢70¢10
Davis Iron Levels	30¢
Davis' Inclinoimeters	10¢10

**Polish, Metal.**

Prestoline	20¢10
Krestoline Paste	35¢45
Gaston's Silver Compound	35¢45

**Pokes, Animal—**

Bishop's I. X. L.	# doz \$6.50
Bishop's O. K.	# doz \$5.50
Bishop's Pioneer	# doz \$3.75
Bishop's American	# doz \$3.00

**Poppers, Corn—**

Round or Square, 1 qt... # gr \$12.00@15.00

Round or Square, 2 qt... # gr \$25.00@26.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger	# doz \$36.00, 25¢10
Fletcher Post Hole Augers	# doz \$36, 20¢
Eureka Diggers	# doz \$18.00@17.00
Lead's	# doz \$5.00@9.00
Vaughan's Post Hole Auger	# doz \$13.00@14.00
Kohler's Little Giant	# doz \$15.00
Kohler's Hercules	# doz \$15.00
Kohler's New Champion	# doz \$20.00
Schneider	# doz \$18.00
Ryan's Post Hole Diggers	# doz \$24.00
Cronk's Post Bars	# doz \$60.00
Gibbs Post Hole Digger	# doz \$30.00, 50¢
Imperial	# doz, \$15, 45¢

**Potato Parers—**

White Mountain	# doz \$5.00@5.50
Antrim Combination	# doz \$5.00
Hoosier	# doz \$13.50

**Pruning Hooks and Shears—**

Diaston's Combined Pruning Hook and	Saw # doz \$18.00, 20¢10
Diaston's Pruning Hook	# doz \$12.00, 20¢10
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat.	# doz \$3.75@4.00 net
Henry's Pruning Shears	# doz \$4.25@4.50 net
Wheeler, M. & C. Co.'s Combination	# doz \$12.00, 20¢
Dunlap's Saw and Chisel	# doz \$5.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

**Pulleys—**

Hot House, Awning, &c.	60¢10
Japanned Screw	60¢10
Brass Screw	60¢10
Japanned Side	60¢10
Japanned Clothes Line	60¢10
Empire Sash Pulley	50¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, \$4.00; Swivel	\$4.50, 50¢10¢50¢10
Hay Fork, "Anti-Friction," 5 in. Solid	\$5.70, 50¢
Hay Fork, "F" Common and Pat.	50¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	60¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel	# doz \$12.00, 40¢

**Pumps—**

Cistern, Best Makers	50¢10¢60
Pitcher Spout, Best Makers	60¢10¢60
Pitcher Spout, Cheaper Goods	40¢10
	70¢10¢55

**Punches—**

Saddlers' or Drive, good	# doz... 60¢@65¢
Bemis & Call Co.'s Cast Steel Drive	50¢55
Bemis & Call Co.'s Springfield Socket	50¢55
Spring, good quality	# doz \$2.50@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinnars'	# doz \$1.44, 55¢
Tinnars' Hollow Punches	20¢25
Rice Hand Punches	15¢
Avery's Revolving	30¢10
Avery's Saw-Set and Punch. See Saw Sets.	

**Rail—**

Sliding Door, Wrt Brass	# ft 35¢, 15¢
Sliding Door, Bronzed Wrt Iron	# ft 7¢
Sliding Door, Iron, Painted	# foot 4¢, 40¢
Barn Door, Light, In.	3/4 3/4
Per 100 feet	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hangers	
Small, Med. Large.	
Per 100 feet	\$2.15 2.70 3.25 net
Terry's Wrought Iron	# foot... 4¢@5¢
Victor Track Rail, 7 1/2 # foot	50¢25
Carrier Steel Rail, # foot	4¢
Moore's Wrought Iron	25¢

**Rakes—**

Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢10¢70
Malleable	70¢70¢55
Gibbs Lawn Rake	\$12.00, 50¢15
Canton Lawn Rake	\$9.00, 50¢10
Ft. Madison Prize Bow Brace and Feet	55¢
Fort Madison Steel Tooth Lawn Rake	\$6.00, 25¢

**Razors—**

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher	\$10.00 to 2

**Razor Strops—**

Genuine Emerson	60¢@60¢55
Imitation	# doz \$2.00, 20¢10¢55
Torrey's	30¢
Badger's Belt and Com	# doz \$2.00
Lamont Combination	# doz \$4.00

**Rivets and Bars—**

Copper... 50¢

Iron, list Nov. 17, '87... 50¢

**Rivet Sets—**

60¢10

**Rods—**

Stair, Brass... 25¢25

Stair, Black Walnut... # doz 40¢

**Rollers—**

Barn Door, Sargent's list... 60¢10¢10
Acme Moulding Anti-Friction	55¢
Union Barn Door Roller	70¢

**Rope—**

Manufacturers' prices for large lots:	
Manila... 1/4 in. and larger	# lb 15¢
Manila... 1/2 in.	# lb 16¢
Manila... 3/4 in.	# lb 17¢
Manila... 1 in.	# lb 18¢
Manila... 1 1/4 in.	# lb 19¢
Manila... 1 1/2 in.	# lb 20¢
Manila... 1 3/4 in.	# lb 21¢
Manila... 2 in.	# lb 22¢
Manila... 2 1/4 in.	# lb 23¢
Manila... 2 1/2 in.	# lb 24¢
Manila... 2 3/4 in.	# lb 25¢
Manila... 3 in.	# lb 26¢
Manila... 3 1/4 in.	# lb 27¢
Manila... 3 1/2 in.	# lb 28¢
Manila... 3 3/4 in.	# lb 29¢
Manila... 4 in.	# lb 30¢
Manila... 4 1/4 in.	# lb 31¢
Manila... 4 1/2 in.	# lb 32¢
Manila... 4 3/4 in.	# lb 33¢
Manila... 5 in.	# lb 34¢
Manila... 5 1/4 in.	# lb 35¢
Manila... 5 1/2 in.	# lb 36¢
Manila... 5 3/4 in.	# lb 37¢
Manila... 6 in.	# lb 38¢
Manila... 6 1/4 in.	# lb 39¢
Manila... 6 1/2 in.	# lb 40¢
Manila... 6 3/4 in.	# lb 41¢
Manila... 7 in.	# lb 42¢
Manila... 7 1/4 in.	# lb 43¢
Manila... 7 1/2 in.	# lb 44¢
Manila... 7 3/4 in.	# lb 45¢
Manila... 8 in.	# lb 46¢
Manila... 8 1/4 in.	# lb 47¢
Manila... 8 1/2 in.	# lb 48¢
Manila... 8 3/4 in.	# lb 49¢
Manila... 9 in.	# lb 50¢
Manila... 9 1/4 in.	# lb 51¢
Manila... 9 1/2 in.	# lb 52¢
Manila... 9 3/4 in.	# lb 53¢
Manila... 10 in.	# lb 54¢
Manila... 10 1/4 in.	# lb 55¢
Manila... 10 1/2 in.	# lb 56¢
Manila... 10 3/4 in.	# lb 57¢
Manila... 11 in.	# lb 58¢
Manila... 11 1/4 in.	# lb 59¢
Manila... 11 1/2 in.	# lb 60¢
Manila... 11 3/4 in.	# lb 61¢
Manila... 12 in.	# lb 62¢
Manila... 12 1/4 in.	# lb 63¢
Manila... 12 1/2 in.	# lb 64¢
Manila... 12 3/4 in.	# lb 65¢
Manila... 13 in.	# lb 66¢
Manila... 13 1/4 in.	# lb 67¢
Manila... 13 1/2 in.	# lb 68¢

Machine—	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand—	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	50¢
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	25¢5¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢5¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	15¢
Barnes' Scroll Saw Blades.....	25¢
Scythe Snaths.....	
50¢25¢	
Shears—	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning.....	See Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....	50¢
Tinners'.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's, List, Dec. 1881.....	50¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	35¢10¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	60¢
Clausen Shear Co., Japanned.....	70¢
Clausen Shear Co., Nickel, same list.....	60¢
Sheaves—	
Sliding Door—	
M. W. Co., list July, 1888.....	50¢10¢60¢25¢
R. & E., list Dec. 18, 1885.....	55¢20¢
Corbin's, list Dec. 18, 1885.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Washita's.....	75¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
Sliding Shutter—	
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools—	
L. & I. J. White.....	20¢5¢
Albertson Mfg. Co.....	25¢
Shoes, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add 1¢ per kg to above prices.	
Or, Wrought—	
Ton lots.....	5¢ 9¢
1000 lb lots.....	5¢ 9¢
500 lb lots.....	5¢ 10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 5 bag, 25 lb.....	\$1.16
Drop, 5 bag, 5 lb.....	20¢
Buck and Chilled, 5 25 lb bag.....	1.41
Buck and Chilled, 5 5 lb bag.....	.34
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
NOTE.—Jobbers frequently give 5¢ 7½¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢10¢
Griffith's Solid C. S. R. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢
St. Louis Shovel Co.....	20¢20¢7½¢
Hussey, Binns & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢7½¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1888.....	30¢
Remington (Lowman's) Pat.....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
Shovels and Tongs—	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
Skeins, Thimble—	
Western list.....	75¢5¢75¢10¢
Columbus Wire Skein, list Nov. 1, 1887.....	30¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skeins.....	60¢
Utica Turned and Fitted.....	35¢
Sieves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barber Flour Sifters.....	50¢ \$2.00
Electric.....	50¢ \$2.00
Hunter's.....	50¢ \$2.00
Smith's Adjustable Sifters.....	50¢ \$2.00
Smith's Adjustable Milk Strainer.....	50¢ \$2.00
Smith's Adjustable T. & C. Strainer.....	50¢ \$2.15
Sieves, Wooden Rim—	
Mesh 18, Nested, 5 doz.....	70¢ 90¢
Mesh 20, Nested, 5 doz.....	85¢ 1.00
Mesh 24, Nested, 5 doz.....	1.10
Slates—	
School, by case.....	40¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hutchins.....	10¢
Andrews.....	40¢10¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢25¢
Covert, New Patent.....	50¢25¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1888.....	35¢25¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	30¢
Ball's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers—	
Bonney's.....	50¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00.....	55¢10¢
Douglas.....	50¢ doz \$9.00, 20¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co's list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co's list.....	70¢10¢
Buffalo S. S. & Co.....	35¢40¢
Silver-Plated—(4 mos. or 5¢ cash 30 days.)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢
Simpeon, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢
L. Boardman & Son.....	50¢10¢
Miscellaneous.	
Holmes & Edwards Silver Co.: No. 67 Mexican Silver.....	50¢10¢
No. 30 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 50 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢50¢5¢
German Silver, Hall & Elton.....	50¢5¢
Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	10¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case 100.....	60¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	75¢10¢80¢
Try Square and T Bevels.....	60¢10¢60¢10¢
Disston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢25¢
Staples—	
Fence Staples, Galvanized.....	Same price
Fence Staples, Plain.....	See Trl. Rep.
Steelyards.....	
40¢10¢50¢	
Stocks and Dies—	
Blacksmith's.....	30¢5¢30¢10¢
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	25¢30¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33½¢45¢40¢
Stone—	
Hindustan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢	
Sand Stone.....	5¢ 2½¢
Washita Stone, Extra.....	15¢20¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	14¢15¢
Washita Stone, No. 1, Extra.....	30¢35¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	40¢
Turkey Slips.....	\$1.00¢1.50
Lake Superior, Chase.....	\$1.15
Seneca Stone, Red Paper Brand.....	18¢20¢
Seneca Stone, High Rounds.....	20¢25¢
Seneca Stone, Small Whets.....	\$2.00
Steve Polish—	
Joseph Dixon's.....	50¢ \$6.00, 10¢
Gem.....	50¢ \$4.50, 10¢
Gold Medal.....	50¢ \$6.00, 25¢
Mirror.....	50¢ \$6.00, 10¢
Lustro.....	50¢ \$6.00, 10¢
Ruby.....	50¢ \$6.00, 10¢
Rising Sun, 5 gro lots.....	50¢ \$6.00, 10¢
Dixon's Plumbago.....	50¢ \$6.00, 10¢
Boynton's Noon Day.....	50¢ \$6.00, 10¢
Parlor Pride Stove Enamel.....	50¢ \$6.00, 10¢
Yates' Liquid.....	50¢ \$6.00, 10¢
5 gal.....	\$0.90 \$0.80 70
Yates Standard Paste Polish, 10-lb cans.....	50¢ \$6.00, 10¢
Jet Black.....	50¢ \$6.00, 10¢
Japanese.....	50¢ \$6.00, 10¢
Fireside.....	50¢ \$6.00, 10¢
Diamond O. K. Enamel.....	50¢ \$6.00, 10¢
Bonnell's Liquid Stove Polish.....	50¢ \$6.00, 10¢
Bonnell's Paste Stove Polish.....	50¢ \$6.00, 10¢
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12½¢
Black Jack Water Paste, 5 and 10 lb cans.....	12½¢
Nickel Plate Paste.....	50¢ \$6.00, 10¢
Tacks, Brads, &c.—	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢5¢
Steel Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	80¢80¢5¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners'.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters' or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Coat Nails.....	60¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Coat Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Coat Nails.....	70¢10¢70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢5¢
Cigar Box Nails.....	50¢10¢50¢10¢5¢
Picture-Frame Points.....	50¢10¢50¢10¢5¢
Looking-Glass Tacks.....	50¢10¢50¢10¢5¢
Leathered Carpet.....	50¢10¢50¢10¢5¢
Brush Tacks.....	50¢10¢50¢10¢5¢
Shoe Finders, list Jan. 2, 1888.....	10¢10¢5¢
Lining and Saddle Nails, list Jan. 1, 1889.....	80¢10¢10¢
Silvered.....	20¢10¢10¢
Japanned.....	20¢10¢10¢
Double-Pointed Tacks.....	35¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.	
Steel-Wire Brads, R. & E. Mfg. Co's list.....	50¢10¢
Tap Borers—	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33½¢5¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33½¢35¢
Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers—	
Tin Case.....	80¢80¢10¢
Thimble Skeins—See Skeins.	
Ties, Bale—Steel	
Standard Wire, list.....	50¢10¢5¢
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.	
Snips, J. Mallinson & Co.....	33½¢
Tinware—	
Stamped, Japanned and Plated, list Jan. 20, 1887.....	75¢75¢5¢
Tire Benders, Upsetters, &c.—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	20¢10¢30¢
Wood Bottom.....	50¢ doz \$5.00¢5.25
All Iron.....	50¢ doz \$4.25
Nashua Lock Co's.....	50¢ doz \$18.00 50¢55¢
Wilson's.....	55¢
Sargent's.....	50¢ doz \$24.55¢10¢
Acme.....	50¢ doz \$20.00, 40¢
Transom Lifters—	
Wollensack's.....	50¢
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiber's, list Jan. 1, 1887.....	50¢
Bronzed Iron Rods.....	50¢10¢2¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps—	
Game—	
Newhouse.....	35¢40¢25¢
Quida Pattern.....	70¢70¢25¢
Game, Blake's Patent.....	40¢10¢5¢
Mouse and Rat—	
Mouse Wood Choker.....	50¢ doz \$1.10¢12¢
Mouse, Round Wire.....	50¢ \$1.50, 10¢
Mouse, Cage, Wire.....	50¢ \$2.50, 10¢
Mouse, Catch-'em-alive.....	50¢ \$2.50, 15¢
Mouse, "Bonanza".....	50¢ \$15.00
Mouse, Delusion.....	50¢ \$15.00
Rat, "Decoy".....	50¢ \$10.00, 10¢
Ideal.....	50¢ \$10.00, 10¢
Cyclone.....	50¢ \$15.25
Hutchins Metallic Mouse, 5-hole traps.....	50¢ \$9.00
In full cases.....	50¢ \$7.50
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diaston's Brick and Plastering.....	25¢25¢10¢
Pease's Plastering.....	25¢
Clement & Maynard's.....	15¢20¢
Rose's Brick.....	25¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
Triers—	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.—	
B. & L. Block Co's list '82.....	40¢
Tubes, Boiler—	
See Pipe.	
Twine—	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	25¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 24¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 24¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 24¢
No. 30, 1/4 and 1/2 B Balls.....	18¢ 27¢
No. 254, Matras, 1/4 and 1/2 B Balls.....	48¢50¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Man Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢14¢
3-Ply Hemp, 1/4 B Balls.....	12¢13¢
3-Ply Hemp, 1/2 B Balls.....	11¢11½¢
Cotton Wrapping, 5 Balls to a.....	15¢18¢
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....	10¢
Wool.....	6½¢6½¢
Paper.....	15¢15¢
Cotton Mops, 6, 9, 12 and 15 lb doz.....	18¢
Vices—	
Solid Box.....	60¢60¢5¢
Parallel.....	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
Parker's.....	
20¢25¢	
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢5¢40¢10¢
Merrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢25¢
Simpson's Adjustable.....	40¢
Moore's.....	20¢
Saw Filers—	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	33½¢10¢33½¢10¢10¢
Stearns' Silent Saw Vises.....	333

APRIL 29, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

Lake.....	@ 16½
"Anchor" Brand.....	@ 16

600 lb casks.....	61
Per lb.....	7

<b>Paints.</b>					
Black, Lamp—Coach Painters'.....	\$ 3	@	24		
Ordinary.....	7	@	16		
Black, Ivory Drop, fair.....	12	@	55		
best.....			83		
Black Paint in oil..... kegs, 84; assorted cans, 111					
Blue, Prussian, fair to best.....	40	@	55		
In oil.....	45	@	55		
" Chinese dry.....			700		
Ultramarine.....	18	@	300		
Brown, Spanish.....			154		
Van Dyke.....	10	@	12		
Driers, Patent American, ass'd cans, 94; kegs, 79					
Green, Chrome.....	15	@	83		
Green, Chrome in oil.....	14	@	85		
Green, Paris..... good, 30¢; best, 35¢					
Green, Paris in oil..... good, 30¢; best, 35¢					
Iron and t. Bright Red.....			214		
Iron Paint, Brown.....			112		
Iron Paint, Purple.....			112		
Iron Paint, Ground in oil, Bright Red.....			512		
Iron Paint, Ground in oil, Red.....			512		
Iron Paint, Ground in oil, Brown.....			512		
Iron Paint, Ground, Purple.....			512		
Litharge.....			64		
Mineral Paints.....	2	@	4		



# THE IRON AGE

THURSDAY, MAY 9, 1889

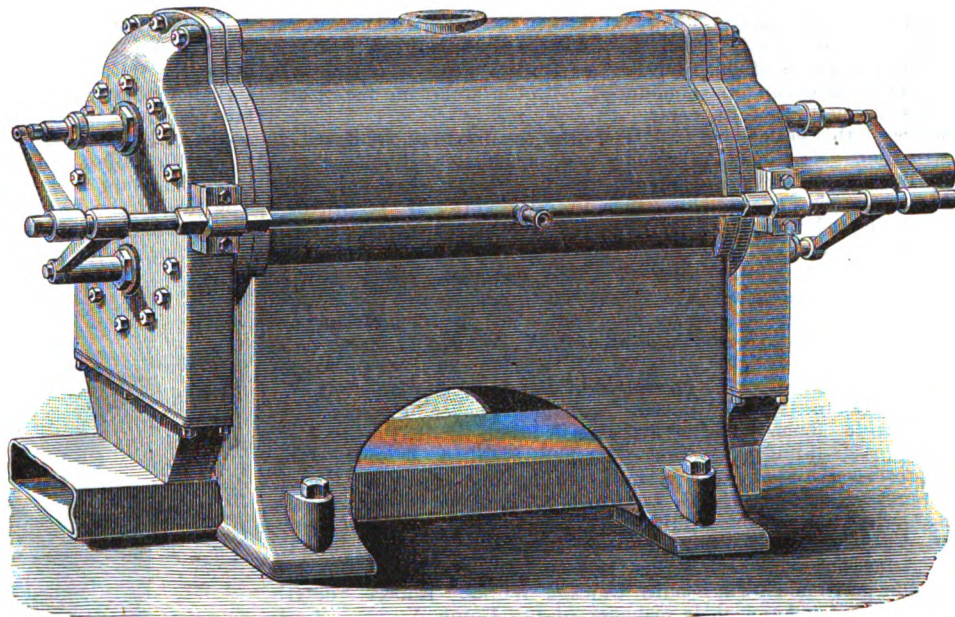
## New Mechanical Air-Valve Gear.

From the recently issued catalogue of the Rand Drill Company, of New York, we take the accompanying engravings and description of their new mechanical air-valve gear:

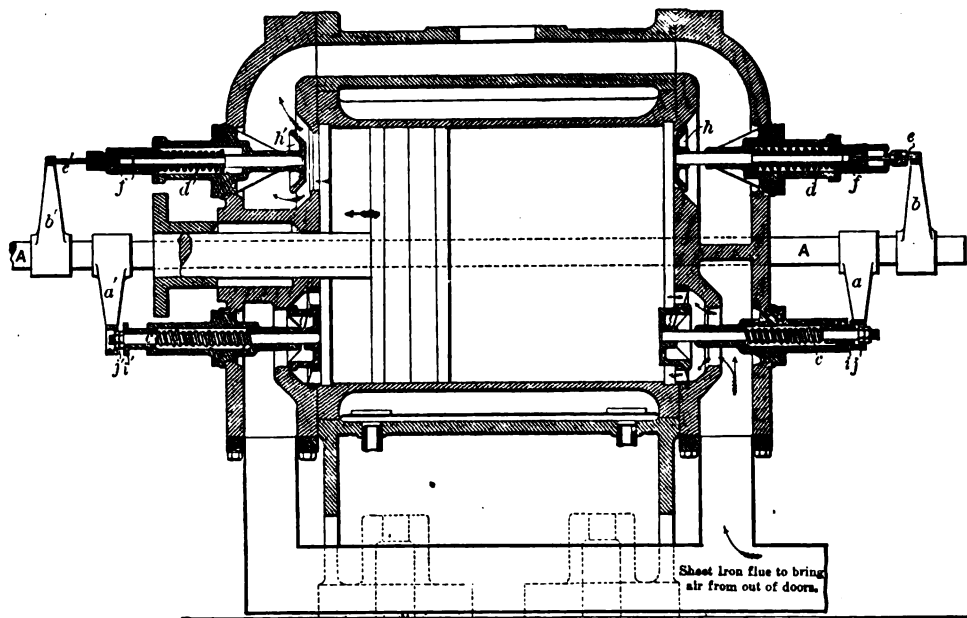
Many attempts have been made to provide a positive movement for air-

meet this condition automatic releasing gears have been applied, involving an amount of complexity which cannot commend itself to sound mechanical judgment. The following gear fulfills perfectly the varied requirements imposed by the discharge-valves, and instead of being an added complexity, it actually reduces the number of parts in a marked degree.

steam cylinders are entirely different. Under the dry heat of compressed air slide-valves are very apt to cut and score themselves and their seats, and so become leaky. This requires replaning or boring the seats, which is a machine job and involves expense and delay. Apart from the tendency to cut, such valves are unfavorably situated for tightness at best.



**Fig. 1.**



**Fig. 2.—Vertical Longitudinal Section.**

**NEW MECHANICAL AIR-VALVE GEAR.—RAND DRILL COMPANY.**

valves. The problem, as related to the suction-valves, is a simple one, but as related to the discharge-valves is difficult or solution, and on this account all such plans have been complex and objectionable. The difficulty of the problem arises from the fact that the discharge-valves should not open at a fixed point in the stroke, but at a point depending upon the pressure of the air carried, upon the altitude above sea-level, the barometric pressure and other factors beyond control. To

It retains the poppet-valve, which long experience has demonstrated to be peculiarly adapted to the requirements of air-compressors, for the reason that such valves have little tendency to wear leaky, and, moreover, any slight leak that may develop is easily repaired by hand-grinding at the first convenient shut-down. All experienced compressor-builders know that slide-valves (whether flat or rotating) are not adapted to use under heavy air pressure. The requirements of air and

The flat head of a cylinder, seriously weakened by the cutting of long ports across it, is certain to spring under the alternate application and release of heavy pressure, and with valves extending clear across these springing heads, tightness is impossible. This is a matter of great importance, as tight air-valves are a necessity if good results are to be reached. The discharge-valves may leak seriously, allowing a large percentage of the air to pass back into the cylinder and the loss

be unsuspected. Even the indicator gives no certain indication of this leak, which is the explanation of the fact that compressors with slide-valves do not give the volume of air which is due to their cylinder capacity. As is well known, valves of the ordinary poppet form chatter more or less, and to reduce this as much as possible it is usual to give them a small lift, making up the required area of passage-way by putting in additional valves. If any one valve could be allowed to open widely and freely it would provide greatly increased passage-way, and this would dispense with the necessity for so many valves. This device stops the chattering, and hence allows us to give the valves a full lift and get the full passage-way due to their area, thus making one valve the equivalent of seven or eight of the usual kind.

Fig. 1 illustrates the appearance of an air cylinder with the new movement applied, and Fig. 2 shows the method of its working. The principle of this gear is as simple as its construction. The usual form of valve chatters because the air tries to pull it open while the spring tries to pull it shut, and first one and then the other prevails. This device simply releases the valve from the pressure of the spring while the valve is open. The spring is used to close the valve, and is made strong enough to do this positively, but before the valve opens and while it remains open it is entirely released from the pressure of the spring, and hence it goes wide open and stays there. In Fig. 2 A is a sliding bar, driven by the main steam-valve stem in the class A and B compressors, by the Corliss wrist-plate in the Corliss engine compressors, and by an eccentric in water-power compressors. Arms *a*, *b*, *a'*, *b'* are keyed to the bar. In the position shown, arm *a* has engaged the washer *i* and moved it to the left, away from the nuts *j*, thus releasing valve *g* from the pressure of the spring *c*. Similarly arm *b'*, through rod *e'* and tube *f'*, has released valve *h'* from the pressure of its spring. The two valves are thus at liberty to open wide and stay there. At the proper moment the springs are relaxed, and as the crank passes the center the valves close. The most peculiar and remarkable feature of the device is that it fulfills perfectly the varied requirements of the discharge-valves without any additional mechanism whatever. The movement of the bar A is so timed that the discharge-valve spring is lifted before the valve is ever wanted to open, the pressure of the air upon the valve (aggregating from 500 to 1000 pounds) being ample to hold the valve to its seat. The spring being relaxed, whenever the pressure in the cylinder equals the pressure in the receiver, no matter what that may be, the valve is ready to open and does open widely and freely. The movement of bar A is so timed that the compression of the inlet spring occurs some time before the piston reaches the end of its stroke, consequently when the piston commences its return stroke, the spring being already compressed, the valve is at liberty to go wide open at once, instead of waiting for the slow movement due to an eccentric, as is the case with the absolutely positive movements. As will be seen, the inlet valve is provided with a guard, and, to lessen the clearance which exists between the valve and guard of the usual form, the valve is here made hat-shaped, as will be understood from the illustration. The clearance due to this form of valve is two-tenths of 1 per cent., which is much less than with the usual form of valve with guard, and is believed to be lower than with any form of valve that has been proposed. We also provide the discharge-valve stems with a safeguard to prevent their getting into the cylinder in case of breakage. This is not shown in the cut, owing to the small scale.

## The Illinois Steel Company.

### The Consolidation Effected.

The consolidation of the North Chicago Rolling Mill Company and the Joliet Steel Company, under the name of the Illinois Steel Company, was successfully accomplished last week. The programme laid down in our issue of the 21st of March was carried out in every respect. The stockholders of the three companies met on the 1st inst. and voted in favor of consolidating. Meetings were held on the days following to arrange the details, and finally on the 4th inst. everything essential had been consummated and the organization of the Illinois Steel Company was announced, with the following list of officers:

O. W. Potter, chairman of the Board of Directors and chairman of the Executive Committee; A. J. Leith, president, with his office in New York; W. R. Stirling, first vice-president; E. C. Potter, second vice-president; R. C. Hannah, secretary and treasurer; Y. B. Haagsma, general auditor. The Executive Committee, who are the governing power of the corporation, are composed of O. W. Potter, J. C. Morse, A. J. Leith, W. R. Stirling and E. C. Potter. The Board of Directors consists of O. W. Potter, Nathaniel Thayer, Francis Bartlett, William J. Rotch, H. H. Porter, J. C. Morse, Marshall Field, A. J. Leith, John Crerar, W. R. Stirling and E. C. Potter. H. A. Gray is agent of the Chicago, South Chicago and Union Works. John C. Stirling is agent of the Joliet Works. John C. Parkes is manager of the Chicago and South Chicago Works. Robert Forsyth is manager of the Union Works. H. S. Smith is manager of Joliet Works. Francis Hinton is manager of the Milwaukee Works. Julian L. Yale is general sales and purchasing agent.

The works now in operation are the South Chicago, Milwaukee and Joliet, the latter having been started again on the 1st inst. The North Chicago and Union will not be operated at present. The first of these to be started will be the Union, and hopes are entertained that the rail trade will be brisk enough to take its product in at furthest two months. The Union blast-furnaces are being overhauled, remodeled and thoroughly modernized during this period of idleness. As speedily as possible the policy of the company with regard to undertaking the manufacture of a complete line of structural shapes and other products will be considered and settled by the Board of Directors.

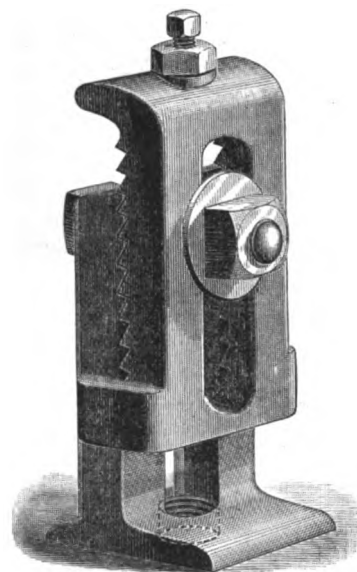
The Illinois Steel Company are capitalized at \$25,000,000. The total annual capacity of their five works as at present constituted is as follows, according to Vice-President E. C. Potter: Pig-iron, 850,000 tons; steel rails, 900,000 tons; structural shapes, 50,000 tons; wire-rods, 50,000 tons; merchant-bars, 60,000 tons; railway splices, 40,000 tons; nails, 15,000 tons. The grand total of these products is 1,965,000 tons. Steel billets are largely made for the open market, but as they are rolled on the rail trains their tonnage is necessarily included in that of steel rails. With respect to tonnage of product the Illinois Steel Company is now the largest steel company in the world. The number of men employed averages about 10,000, but the force will be increased as the demand for iron and steel improves and as additional departments now contemplated are constructed.

The consolidation of these three companies is one of the most remarkable events in our industrial history. Each company was conducting a successful business, each was managed by men of more than ordinary shrewdness in conducting

manufacturing operations on a large scale, and each had reason to look forward to years of prosperity as solidly-established enterprises. But their managers concluded that it would be possible to conduct them even more satisfactorily to their stockholders if united in one concern, and they proceeded to do so. It remains to be seen whether any manufacturing establishments in other parts of the country will follow their example, or whether the founders of the Illinois Steel Company will have accomplished an achievement unique in its character and impossible of imitation.

### Adjustable Clamping-Block.

In our issue of August 23, 1888, we described an adjustable clamping-block made by the Energy Mfg. Company, of Philadelphia. Since then several important changes have been made in the block, as shown by the annexed cut. This block is used for filling under clamps and work when clamping to various machine tools. The top of the block is fitted with a set screw, so that it can be used as an adjustable screw-block when blocking up work, and



Adjustable Clamping Block.

in a number of other ways will be found handy about the shop. The base of the block is taped so that if it is necessary it can be fastened to the machine on which it is used, as on the face-plate of a lathe when used as a block or driver for pulleys, &c. They are made in five sizes, filling under from 2½ inches to 21 inches.

### Cost of Storage-Battery Power.—

The following figures are given out by the Julien Electric Traction Company as actual results attained on the Fourth avenue surface road, New York City, in running cars with storage batteries. A car can run in actual work 57½ miles without recharging. During 40 days that the car in question has been at work neither batteries nor motors have required attention or expense for repair or renewals. The batteries of one car that had been running since September 3, 1888, were examined on the 8th ult. for the first time, and are stated to be in as good condition as when put in. The cost of motive-power is calculated at \$3.10 per car per day of 60 miles. This is the cost of energy at 2 cents per horse-power, at which it is offered to be supplied by the electric companies, and \$700 per annum for maintenance of batteries and motor.

The Governor of Pennsylvania has signed a bill making September 30, Labor Day, a holiday.

**Steel as an Engineering Material.**

While the growing use of steel as an engineering material testifies unmistakably to its superior stability for general purposes, yet the *Engineer* holds that there are situations where it appears to be rejected in favor of iron, and these instances seem lately to have been on the increase in England. The greater liability of steel to corrosion is in many cases the cause of this preference for the older metal, especially in boilers where the feed-water is bad. Much has been said anent Thames mud, but it is doubtful whether it is worse than

meeting just held of the South Staffordshire Institute of Iron and Steel Works Managers. A paper was read by Mr. G. H. Walkeden, entitled "Notes on the Lancashire Boiler," and in the course of discussion this topic of electrolytic action was touched on by Mr. A. E. Tucker, metallurgical chemist, of Smethwick. He knew, he said, of cases in that district in which boiler explosions had been clearly attributed to electrolytic action set up by the combination of iron and steel in the construction of the boiler, and by the presence of brass fittings. This action had sometimes been set up by the use of

**Ashland Blowing Engine.**

The engine of which we herewith present drawings was built by E. P. Allis & Co., of Milwaukee, Wis., for the Hinkle Furnace of the Ashland Iron and Steel Company, of Ashland, Wis. It is one of the finest of its class, and is designated as a "vertical direct-acting type," having steam-cylinder below and air-cylinder above. The steam-cylinder is 34 inches in diameter by 4 feet stroke, and is fitted with a Reynolds Corliss valve gear. The air-cylinder is 78 inches in diameter by 4 feet stroke, and has the Reynolds patent positive-motion air-valve. The two fly-wheels weigh 31 tons, and the total weight of the machine is 92 tons. The speed of the engine is controlled by a fly-ball governor attached to the cut-off cams of the steam-valve, and the speed can be varied from 12 to 50 revolutions by simply turning a hand-wheel, the engine remaining absolutely under control of the governor.

The special feature of the machine is the valve gear of the air-cylinder, which was invented and patented by Edwin Reynolds, superintendent of the Reliance Works of E. P. Allis & Co. In each cylinder head are two rolling valves, each 16 inches in diameter, one being the inlet and the other the discharge. The inlet-valves, shown to the left in Fig. 2, are opened and closed positively by means of a direct connection with a wrist-plate. The discharge-valves shown at the right in the same drawing are closed at the proper time by the same wrist-plate that drives the inlet-valves, but are opened automatically when the air in the cylinder reaches the same pressure as the air in the blast-pipe leading to the furnace. In other words, while the inlet-valve is opened unvaryingly by means of its connection with the wrist-plate, the delivery-valve is so constructed and arranged as to open automatically and instantaneously to its full capacity when the pressure in the air-cylinder is nearly or quite equal to that in the receiver. The construction by which this is accomplished is exceedingly simple, reliable in its action and capable of adjustment to meet desired requirements. The wrist-plate is driven by an eccentric on the main shaft of the machine through suitable connection. The connection between the wrist-plate and the delivery-valve is by means of a rod slotted to receive a pin on the actuating arm of the valve, and is positive in its motion only at such time as the rod is moving toward the cylinder head and acting upon the valve to close it. When the motion of the wrist-plate is reversed the slotted end of the rod permits the reverse motion of the wrist-plate and rod to take place, while the delivery-valve remains closed, being held in that position by a hook or catch until it is automatically released and allowed to open. Attached to the stem of the valve is an arm, provided at its outer end with a pin and block, on which is also attached by pin and rod a weight working in a dash-pot. To a fixed pin is pivoted a hook provided with a tail-piece engaging with the block. The piston-rod of the piston of a small supplemental cylinder is so arranged as to disengage the hook at the proper time to allow the weight to open the delivery-valve. When this valve is closed the piston-rod is free of the hook, and yet so near that a short movement will cause it to bear against and release the hook. The small cylinder is connected by pipe in its top with the receiver or blast-pipe leading to the furnace, while a second pipe connects the other end with the end of the main cylinder, so that on one side of the piston there is always the pressure of the air in the receiver, while on the other side there is whatever pressure there may be in the main air-cylinder.

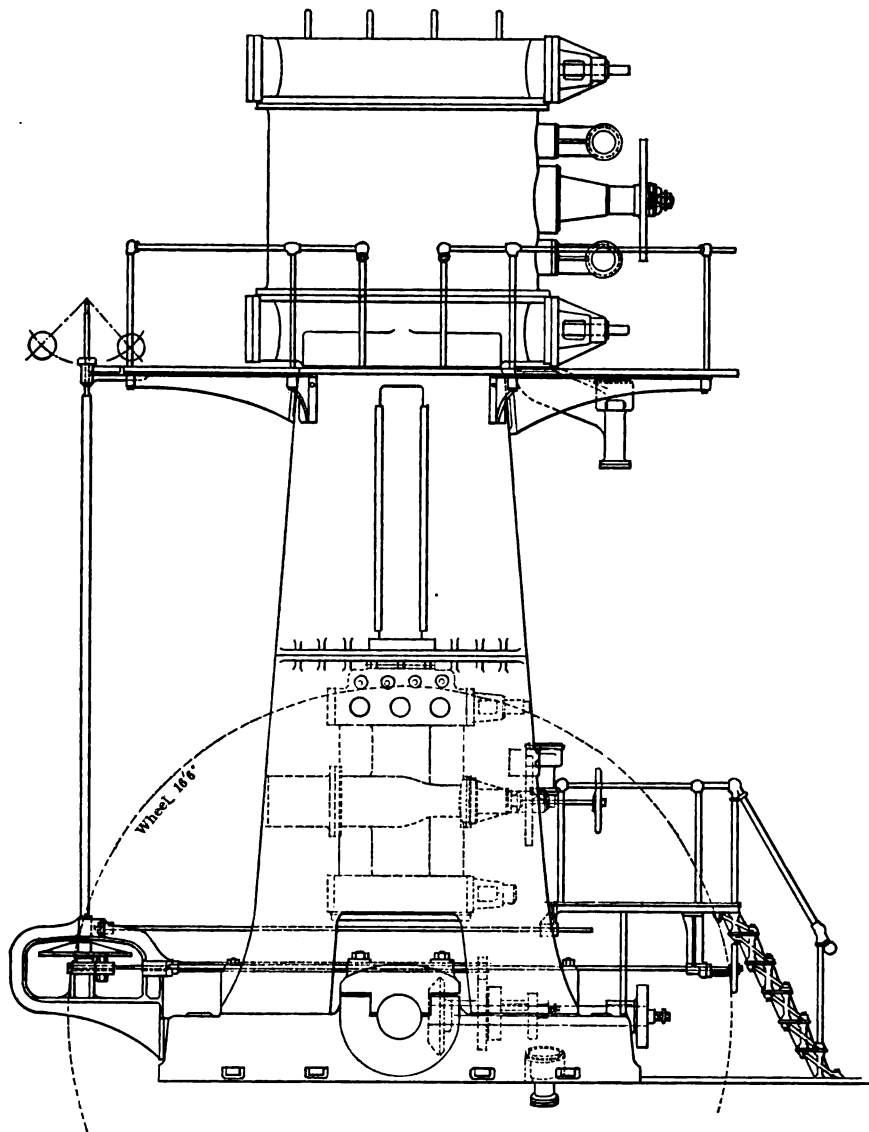


Fig. 1.—Side Elevation.

**THE ASHLAND BLOWING ENGINE.**

the ingredients of Staffordshire canal water; anyhow, the latter element is a serious nuisance to the steam user. This perhaps is why one sometimes hears of such cases as a Staffordshire steam user paying as much as \$2000 for a boiler 30 feet long by 8 feet, and insisting, as one of his chief conditions, that it should not be made of steel. In many cases, however, steel is doubtless condemned unnecessarily. An iron-master put steel in the bottom of his boilers, and had to have them rebottomed before it had worn three months. He put in iron, and the iron continued very much longer. In a case like that there must, one would think, have been some serious defect somewhere. More often than steam users think, failures in boiler working arise from electrolytic action where various metals are in conjunction. A notable instance of this kind was mentioned at a

tie rods of manganese bronze and phosphor bronze and similar materials. The intention had been to prevent corrosion, but the effect was just the reverse, for the electrolytic action had been very marked at both ends of the tie rods, and the steel plates had been correspondingly corroded at those particular points. Doubtless many instances of the kind adduced by Mr. Tucker could be recorded where the blame rests neither with bad feed-water nor with the quality of steel, but with unsuitable combinations of metals.

Mills for the manufacture of cotton in the Southern States are multiplying rapidly. Within a short time 15 companies have been organized, three of them in Alabama. In several instances capitalists from Philadelphia and New England are concerned.



The action of the mechanism is as follows: As the wrist-plate and rod operating the delivery-valve move toward the head the delivery-valve is closed positively, and as the extreme limit of motion of the wrist-plate is reached the hook is thrown forward, engages with the block and holds the valve closed. As the motion of the wrist-plate and rod is reversed the forked end of the rod slides back upon and independently of the pin on the valve-stem arm, and consequently allows the delivery-valve to remain closed until such time as the pressure in the air-cylinder, and consequent pressure on the under side of the supplemental piston connected with the air-cylinder by a pipe, is sufficient to overcome the pressure on the opposite side of the piston connected with the receiver, when the piston will move forward and its rod will strike against the hook and thereby disengage it from its block. When this takes place the weight instantly opens the delivery-valve to its full extent, and it remains open until again closed by the action of the wrist-plate and its rod on the reverse stroke. It is evident that, if deemed desirable, the receiver pressure on the upper surface of the piston in the supplemental cylinder can be counterbalanced so that the piston will move forward to trip the hook and allow the valve to open before the pressure in the main air-cylinder equals that in the receiver. The complete action of the valves on one end of the air-cylinder may be briefly described as follows: At the beginning of the stroke the delivery-valve is closed and the inlet-valve begins to open, opens very quickly, and remains open until the piston reaches the opposite end of its stroke. Just as the piston begins its return stroke the inlet-valve is closed and is retained against its seat by the receiver-pressure on its back. As the piston moves back the air before it is compressed until it equals the pressure in the receiver, when the piston in the small cylinder moves forward, disengages the hook and permits the opening of the delivery-valve instantly to its full extent. At the time of its opening the delivery-valve is in equilibrium, so that the amount of power required to move it is very small.

The construction of the steam-cylinder valve gear will be understood from the drawing Fig. 3. At 50 revolutions this engine has a capacity of 13,000 cubic feet of air per minute. It is believed that this machine has all the points desirable in a blowing engine—namely, maximum quantity of air with a minimum consumption of steam and a great range of speed with a high economy at any number of revolutions.

**The Duty on Crop Ends.**—In accordance with the recent action of the United States Court for the Southern District of New York in directing a verdict for the plaintiff in the case of *Dana vs. Magone*, the Treasury Department has directed the collector at New York hereafter to assess the duty on steel crop ends, consisting of imported steel rails or ends cut from steel rails in the process of manufacture, and of ends cut from steel blooms, at 45 per cent. ad valorem, instead of at 7½ cent per pound, as has been the practice heretofore.

For many years in war ships no other than the horizontal engine for screw vessels was used, on account of the necessity for the most complete protection involved, and on this account the efficiency of the machinery arrangement was considerably reduced. Within a comparatively few years, however, ingenuity and skill have triumphed over this difficulty, it having been found possible to sufficiently protect the cylinders of vertical engines from danger by projectiles, and this type of en-

gine has in all such cases invariably been thus fitted. The advantages gained by the use of the vertical engine instead of the horizontal are very considerable, the engine working far more smoothly, wearing more evenly, and all parts being much more accessible for inspection.

#### Economics of Coke Manufacture.

Reference has already been made in these columns to the new method of coking introduced by the National Coke and

development of other industrial improvements, difficulties and obstacles were met with that it needed much patience in experimenting to overcome.

The practicability of the process depends simply on the facts that volatile matters are now burned up in coke-making very much in excess of what can be usefully applied in the manufacture of furnace coke, and that increased economy of heat can be effected by covering the charging-hole or top-eye of the coke oven and leading off the waste products of combustion

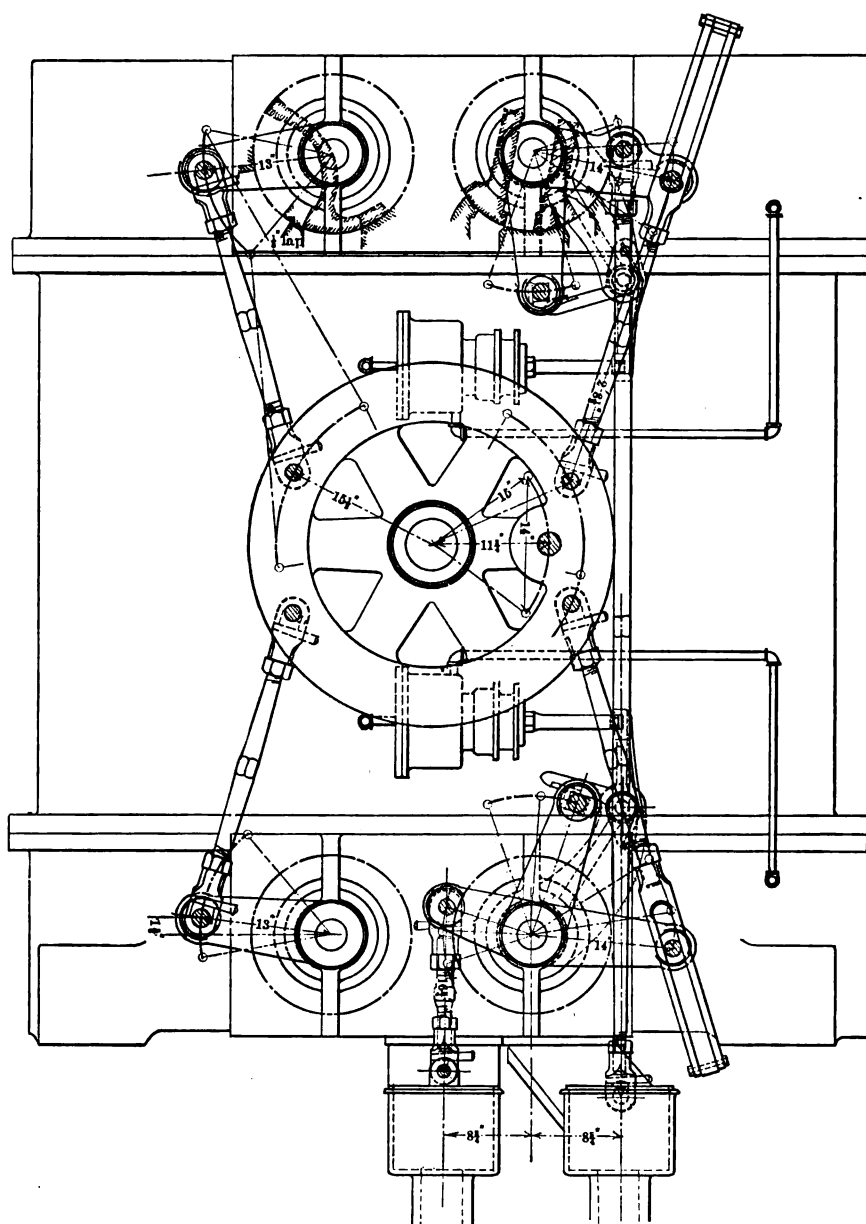


Fig. 2.—Air-Cylinder Valve Gear.

#### THE ASHLAND BLOWING ENGINE.

Fuel Company, of Chicago; and it is now proposed to give some further details of the results that have been obtained. Mr. R. H. Lewis, the general manager of the Calumet Iron and Steel Works, where these experiments have been tried, says they got from every ton of coal coked 15,000 cubic feet of fuel gas, equal in quality to that from Siemens producers; 3 to 5 gallons of coal oil, which sells in the crude state for creosoting purposes at 10 cents per gallon, and liquors containing ammonia equivalent to about 3 pounds of sulphate. The process used has been known abroad for some years, under Mr. J. Jameson's patents several plants in the North of England having been continuously operated for several years with varying success. In this, however, as in the

by a flue placed about 10 inches above the surface level of the charge of coal and at the back of the oven, or in other words directly opposite the door. Another advantage of this arrangement of flues is that these hot waste gases being conveyed through a large main flue-way running the whole length of the bunch of ovens, considerable of the residual waste heat can be usefully applied in the production of steam or otherwise, and the gases then led, at a temperature of about 400° F., into a tall chimney, by means of which an almost unvarying draft is maintained and the operation of coking thus rendered much more uniform. All admit that in the manufacture of blast-furnace coke there may be no recovery of by-products that involves deterioration in the quality of the



main product. It is for this reason, among others, that none of the many such processes of coke-making in retorts or close ovens has come into general use. The National Coke and Fuel Company's recovery process is, so far as known, the only one permitting of that most essential condition for the production of furnace coke, an intensely high temperature in the interior of the oven.

tillation from its under and inner surface. Clearly in the production of say 15,000 cubic feet of gas per ton of coal coked the average rate of withdrawal from each oven will be only about 84 cubic feet per minute. It is this, together with the fact that exhaustion equal to about 8 inches head of water must be maintained in the passages immediately beneath the oven floor, which gave rise at several places

18 months, and now the patents on all construction improvements as well as those covering the principle or groundwork of the process have been secured by this company, in which several well-known Chicago men are largely interested. Experiments have been instituted directed to the separate collection of the richest portions of the fuel gas and to their further enrichment by the aid of recovered oil or less valuable crude petroleum and the application of heat now wasted at the ovens. The company are advised by an eminent gas engineer that this gas thus enriched could be easily fitted for illuminating purposes. What may be their immediate intention in regard to the application of this process we do not know; but nothing can be more clear and satisfactory than the great benefits which will ultimately accrue to the country from the universal application of such economic improvements.

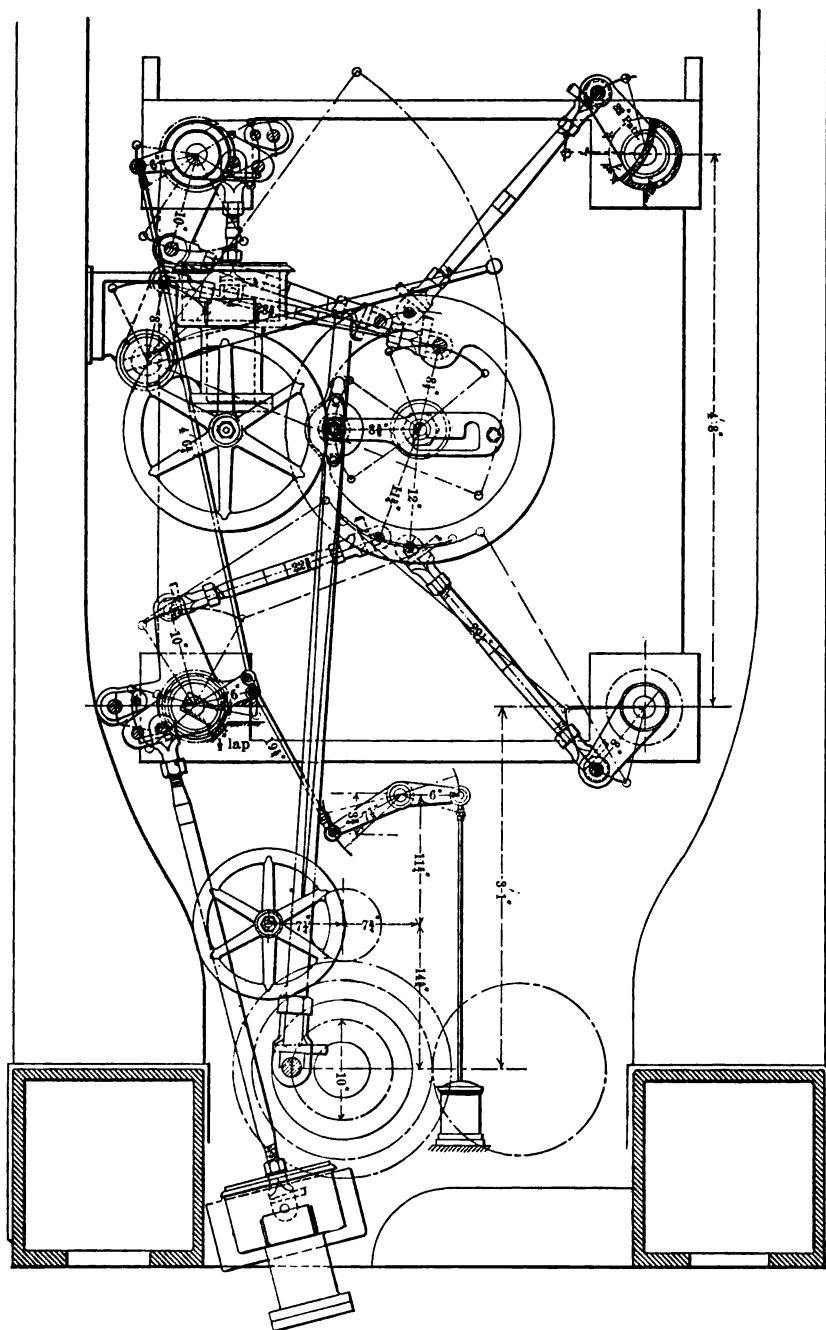


Fig. 3.—Steam-Cylinder Valve Gear.

#### THE ASHLAND BLOWING ENGINE.

This method consists in the withdrawal through a hollow floor, by gentle exhaustion, of a certain proportion of the volatile matters distilled from the coal in an ordinary beehive oven, advantage being taken of the fact that soon after an oven load of coal is lighted on top in the ordinary way a pasty seal of melted and decomposing coal is pressed around the sides and on the upper surface of the charge. This "seal" in the progress of the burning advances inward toward the center and downward toward the bottom of the charge or to the surface of the oven floor. Its existence permits of the continued exhaustion of the first products of dis-

to partial failures and to disappointing results with this process. It had to be discovered by tedious and costly experiments made near Durham, England, that the access of very little air to the hot gases beneath the oven floor was fatal to good results; that the means which were in the first relied on to prevent such access yielded after a time to the deteriorating influence of sudden and violent changes of temperature, and that special methods had to be devised and proved for securing not temporary, but permanent, immunity from leakage.

The tests made by the National Coke and Fuel Company have extended over

#### Damages for Insufficient Car Service.

At Pittsburgh last week Riddle, Dean & Co. brought suit in the United States Court, under the Interstate Commerce act, against the New York, Lake Erie and Western Railway Company. The plaintiffs are agents for the sale of coal on commission for mines near Pittsburgh. In November, 1887, they claim they received orders from Cincinnati for coal, and placed the order with mines on the Pittsburgh, Chartiers and Youghioghenny Railroad, a branch of the Pittsburgh and Lake Erie. The latter road connects with the New York, Pennsylvania and Ohio, which is operated by the defendant company, at Youngstown. On September 26, 1887, a coal tariff was issued from the mines of the Pittsburgh, Chartiers and Youghioghenny and Pittsburgh, McKeesport and Youghioghenny railroads to points on the New York, Pennsylvania and Ohio, including Cincinnati, at \$1.10 per ton. Acting under the tariff the plaintiffs gave an order to the railroad company for five cars per day. At the same time the Lake Shore mines, on the Pittsburgh, McKeesport and Youghioghenny Railroad, gave an order for from five to ten cars per day with which to supply an order from Cincinnati. A few days later the railroad company issued an order to stop all cars *en route* and to load no more with coal for Cincinnati. On January 3, 1888, the company withdrew the rates to Cincinnati on coal and refused cars for there. The order of the Lake Shore mines, however, was filled. The plaintiffs claim damages by reason of the treatment they received from the New York, Lake Erie and Western Railway Company to the extent of \$10,290, the amount of loss on that contract. The case was before the Interstate Commerce Commission, but was decided against the plaintiffs, who have now brought it before the United States Court.

Congressman Springer, the chairman of the House Committee on Territories, is elated about Oklahoma. He says it is a greater event than the California gold discovery, and that in ten years Oklahoma will be as popular as Kansas. He believes it will settle the Indian question. The land not required for the Indian will be occupied by white men, and they will become his co-workers in the production of wealth and the development of the resources of the country. Mr. Springer said he hoped that within a few weeks or months the Cherokee outlet, containing over 6,000,000 acres, would also be opened for settlement, while that part of the Seminole and Creek purchase west of the 98th meridian and north of the Canadian River, containing about 3,000,000 acres, would also be opened at an early day. He believed that Congress would at once pass a territorial bill for Oklahoma.

### The Newport News Dry-Dock.

The formal opening of the great dry-dock at Newport News a few days ago is regarded as the initial step in a comprehensive scheme for building iron steamships on Southern soil. This dock is the largest in the country, the length on top being 600 feet. At the Portsmouth Navy Yard there is a Government dock 500 feet long, while the one that is being built at the Brooklyn Navy Yard is about the same length as the one at Portsmouth. The Chesapeake Dry Dock and Construction Company, who have constructed the immense dock, expect, on account of its vast dimensions, to secure the docking trade of all the ocean steamship lines. The cost of the dock is \$525,000.

The dimensions are as follows: Six hundred and thirty feet long from head to outer sill, 130 feet wide at top and 50 feet at the bottom, and 33 feet deep, with a slope in the bottom of 24 inches to the 560 feet. The approach to the dock is piling, 250 feet long and 150 feet wide, while on each side piers 80 feet wide afford ample wharf room. The caisson is an iron structure 96 feet long on top, 50 feet at bottom and 33 feet deep. The dock is supplied with two centrifugal pumps of a capacity of 40,000 gallons per minute, each of which empties it in 1 hour and 36 minutes. The combined power of the two engines is 500 horsepower. At high tide the dock contains 8,500,000 gallons of water, and at a recent trial with two pumps was emptied in 1 hour and 37 minutes, which is equal to each pump throwing about 44,000 gallons of water a minute. Besides docking and repairing ships, the company are preparing to build iron hulls of the largest dimensions, and to that end have already placed alongside the dry-dock an extensive plant of machinery, to which additions will be made from time to time as the magnitude of the work increases.

Sinking shafts in soft earth or quicksands is a difficulty which has been overcome by the Poetsch Sooyamith Freezing Company, and an operation of this kind in the collieries at Wyoming, Pa., is watched with special interest. Two shafts are to be put down by different methods—one by the pneumatic system and the other by freezing. The earth through which the shaft is to be sunk is of a soft nature, and much of it has to be driven through a bed of quicksand. In the new system of freezing iron pipes are driven into the earth to be excavated, and through these a cold solution is circulated, causing the sand and dirt to freeze solidly. It can then be dug by the workmen without any attendant danger, and is forced by means of compressed air to the surface. The size of the shaft is 25 x 25 feet, and it will be sunk in this manner 105 feet before rock is reached.

A little English road, the Lynton and Lynmouth, which is expected to be opened early in July, will probably have the steepest gradients of any in the world, the inclination being 1 in 14 throughout its short length of 300 yards. Starting from the esplanade at Lynmouth, the carriages will ascend a vertical height of nearly 500 feet in one minute. The motive-power will be water, conveyed in a line of pipes nearly 1 mile from the West Lynn River. The carriages will run on steel rails, and there will always be an ascending and descending carriage, the two being connected by two steel wire ropes, so that when both carriages are empty, or when both are equally loaded, one balances the other. When the ascending load is heavier than the descending one the difference will be made up with water, let into the tank be-

neath the descending carriage. The carriages are fitted with eight brake blocks, which may be instantly and automatically applied to grip the rails, which latter are bolted to the slate rock through which the cutting is made. This method of counterbalancing the weight of the ascending carriage by means of water admitted to the descending carriage was, if we remember rightly, first employed by Fulton. Plans have also been prepared for a similarly operated road in the Catskills.

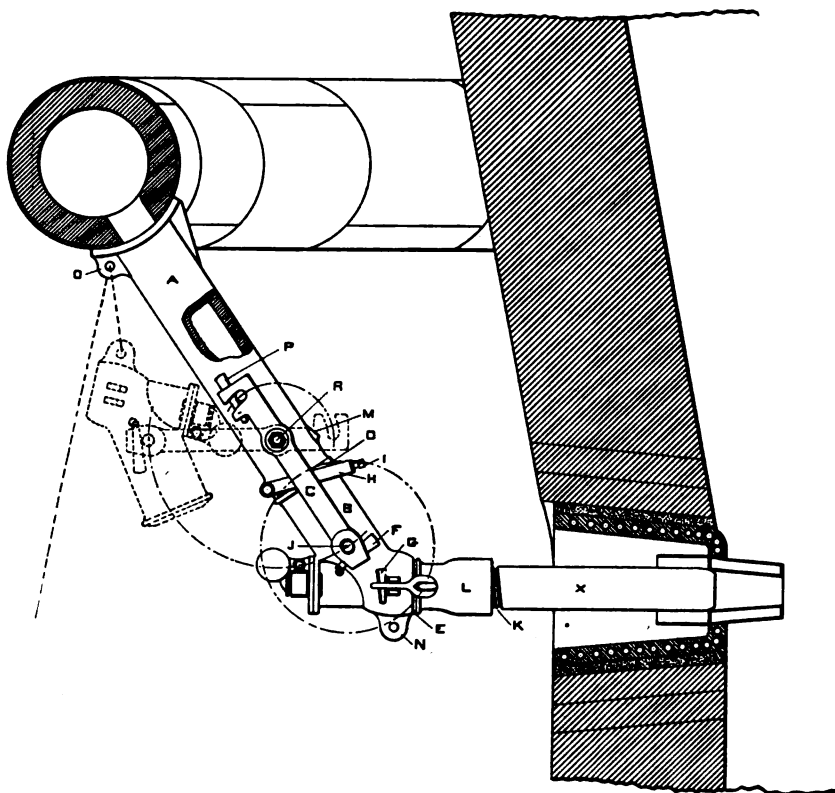
### The Roberts Tuyere Stock.

The main difficulty that has been experienced with existing tuyere stocks in which one section is movable has been the great weight of the movable part and consequent inconvenience in handling. Frank C. Roberts, Philadelphia, has designed a tuyere stock with a view to avoid

access to the tuyere opening, a rope is passed through lugs N and O, the blow-pipe released as before and the key P removed. This permits the movable section C of the stock to revolve on the center R to the position shown by the dotted lines. Of course, no claim to originality is made by Mr. Roberts for the ball joints and side suspension bars, these being used in other designs for tuyere stocks.

### Sodium Manufacture in England.

The Alkaline Reduction Syndicate, Limited, says the *Chemical Trades' Journal*, have leased ten acres of land belonging to Charles Tennant & Partners, chemical manufacturers at Hebburn, and adjoining the Tharsis Copper Works at the same place, for the purpose of producing metallic sodium by a process patented by Captain Cunningham. The alkaline syndicate also propose treating certain refractory



THE ROBERTS TUYERE STOCK.

this difficulty, the object being accomplished by making the movable section short in length and, as a result, light in weight. The full lines in the accompanying illustration show the stock when connected to the furnace, while the dotted lines show the position of the movable section when disconnected to allow free access to the tuyere opening. The stock proper is divided into two parts, A, B, the lower section, B, being suspended from A by side bars, C. Ball joints are provided at D and E. The seating of these joints is adjusted by means of keys, F G. The blow-pipe X is brought to its seat in the tuyere by means of the bail H and set-screw I; the operation of the latter causing the movable section B of the stock to turn on the center J of the ball joint D. The length of the blow-pipe is adjusted in the ordinary manner by means of the screw thread K working in the socket L.

When it becomes necessary to replace a tuyere, the blow-pipe is disconnected by knocking out keys G, loosening keys F, raising the adjusting bail H to the seat M and turning the movable section B on the center J. The tuyere may then be taken out. When it is desirable to obtain free

metalliferous ores, and have already commenced the construction of their works, which will be on a moderate scale at first, but which the firm expect will ultimately attain very considerable dimensions. Captain Cunningham and his son are to be the chief engineers. The metallic sodium produced by the syndicate at Hebburn is to be sent to Wallsend, where it will be used by the Alliance Aluminium Company—who have made arrangements for erecting large works there—in the manufacture of the metal aluminium on a very large scale. The object of the Alkaline Reduction Syndicate at Hebburn and the Alliance Company at Wallsend is to produce aluminium by the new and extremely cheap process. In the production of sodium the syndicate have so far conducted their work in an experimental manner, and the experiments are now to be put to a practical test by erecting works on a manufacturing scale. If the test is successful, then large works will be built at Hebburn for the production of sodium to be supplied to the aluminium company at Wallsend. The Hebburn syndicate and the Wallsend company are separate and distinct firms, but each is composed of well-known and influential capitalists.

### The Wells Light.

Although this lamp was only put on the market last season, it has been widely adopted in England, and is now being introduced into this country by Wallwork & Wells, whose temporary address is *The Iron Age*. There are over 200 in use on the Manchester Ship Canal, and the contractor states that if it had not been for this portable light night work could not have been carried on as effectually as it has been. It is especially adapted for lighting railway work, bridge buildings, coal wharves, docks, foundries, &c. We illustrate two of the several forms made—the portable, and that arranged either for heating or lighting.

The tank is made of the best steel boiler plate and will stand rough usage. By means of a small hand-pump screwed into the top, and which can be quickly taken out for the renewal of leathers, &c., oil is

ers with oil led through suitable pipes. The necessary pressure is obtained by connecting the tank with the town's water-supply. The water can be regulated to any pressure by a reducer, and the only expense for driving is 1 gallon of water to 1 gallon of oil. When the water has pushed all the oil out of the tank, as shown by the glass gauge, the water is drawn off and the tank again filled with oil. The lamp burns a cheap creosote oil, obtained in the distillation of coal tar, and which costs in England 2d or 3d per gallon.

### Maintenance of Steamship Lines.

One of our commercial contemporaries has a plausible argument favoring special measures by Congress, or at least the Post-office Department, for the permanent establishment of steamship communication, under the American flag, between

purpose of building up the merchant marine, as may be gathered from the letter of a member of Parliament recently published in the *London Times*, in which he says, in replying to a criticism that England was losing £1000 a day by its ocean mail service: "As a matter of fact these subsidies are not paid to make up a deficiency in the postal accounts, but in order to keep up the character of our merchant fleet." The debates in Parliament and official reports are crowded with similar testimony. According to the report of the British Postmaster-General for the year 1885, the total amount paid that year for subsidies with ocean steamship lines amounted to £774,626, equal to \$3,870,000, but by reference to the detailed statement of the specific sums of which this total is made up it will be found that only about one-half is paid to lines running to British colonies, and that the other half is for steamers

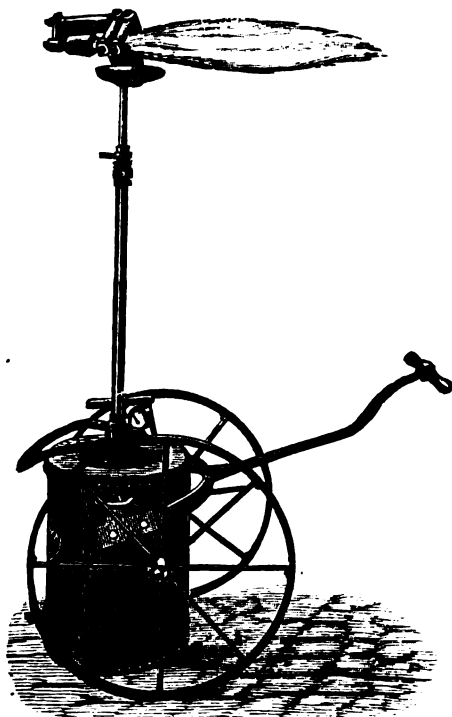


Fig. 1.—Portable.

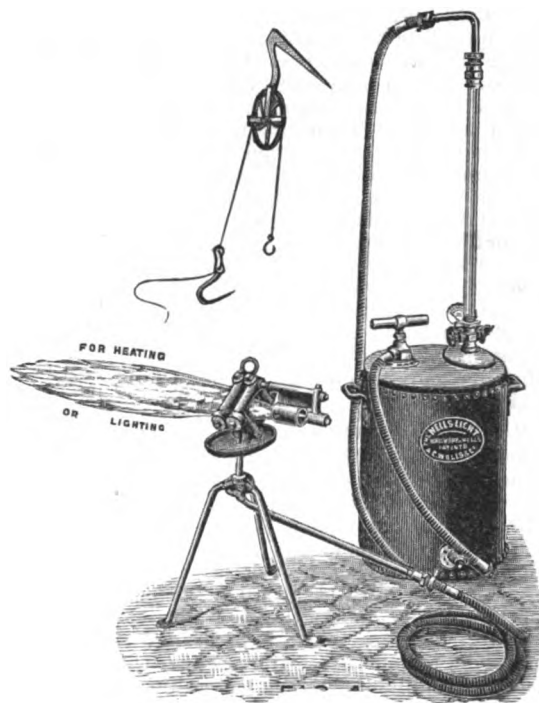


Fig. 2.—For Heating or Lighting.

### THE WELLS LIGHT.

pumped into the tank from a bucket or cask until the air already in the tank is compressed to about 25 pounds pressure. The burner is then heated by burning a little oily waste in the cup. The valve being opened, the oil is forced up by the air pressure into the heated burner, and being converted into gas, issues from the jet and burns as a large brilliant flame. The heat of this flame passing through the generating tubes continuously turns the fresh ascending oil into gas. The lamp is continuous in operation, as the oil can be pumped into the tank while the light is burning. When charged with air, at 25 pounds pressure, the lamp will burn for four or five hours, or until the pressure is reduced to 8 pounds, without regulating the oil-tap feed. The falling pressure does not diminish the power of the flame. The great difference between this lamp and those of the Lucigen class is that it requires no outside connections or continuous motive power, such as air or steam; and as the oil is driven out and burned as a gas, and not as a spray, there is no loss of oil when the flame is deflected by wind. When the light is used in a foundry or large works, one tank supplies all the burn-

ports in the United States and important foreign markets. It says:

It is useless to attempt to disguise the fact that the British Government not only pays liberal mail subsidies, but the amount is usually fixed far in excess of any reasonable compensation for the mere transportation of a few bags of mail matter from one port to another, and this is done with the avowed object not only of transporting the mail, but of affording such compensation as will insure the maintaining of the service against any foreign competitor. It is by this means that a trade is built up that in time renders the enterprise so far independent of Government aid that a reduction of the subsidy can be submitted to without crippling the service or impairing the profits which the shareholders have previously received and part of which has been drawn direct from the public purse. The fact is that, as an illustration of success, the policy of the British Government in this respect is unanswerable, and until we follow it our mercantile marine will remain in the same humiliating position that it now occupies. Further than this, the English themselves openly admit that these subsidies are for the

trading with foreign countries. When Louis Napoleon sought to establish a line of steamers trading with India and China, he first of all granted the *Messageries Impériales*, as it was then known, a subsidy that enabled it to compete successfully with the Peninsular and Oriental Company, that up to that time had enjoyed a monopoly of the Eastern traffic and established the large and prosperous business that is now carried on by the *Messageries Maritimes*. At one time the English Government paid the Peninsular and Oriental over £400,000 per annum in order to sustain it against the competition that it had to face. These heavy subsidies not only developed a trade that since then has supported several lines of steamers, but in return brought thousands of pounds in trade to British ports.

It is stated that there is 20 per cent. less surplus of iron ore at Lake Erie ports this year than last. It is learned that on May 1, 1889, there were 558,753 gross tons on dock, while on May 1, 1888, there were 703,720 tons. The winter shipments were 1,289,802 tons, or over 50 per cent. greater than during the winter of 1887-88.

## The Paris Exposition.

(From a Special Correspondent.)

The eleven years since 1878 have not been lost on the French people, and the exhibition about to be opened will show wonderful progress in all branches of engineering and mechanical works. While retaining the finish and perfection of detail for which they have always been noted, their ambition and their daring, which have been quite as prominent characteristics, have been turned into industrial channels. Having renounced, at least for the present, the hope of military renown, they are striving to win distinction in the peaceful rivalry of industrial progress. There is a good deal of political feeling, too, underlying their interest in this exposition. They desire to show the progress their country is making as a republic, and that under such a government a Frenchman can have quite as much to gratify his national pride as under an empire or a monarchy. They are, therefore, determined to eclipse all previous exhibitions. The Eiffel Tower is nearly twice as high as any other structure in the world. Their machinery hall is the largest room in the world without a pillar. Their buildings are all not merely houses to contain the exhibits, but beautiful architectural works, ornamented in the most lavish manner with mosaics, statuary, stained glass, paintings and decorations of every kind. The regulation of the exhibits, too, is carried further than at any previous exhibition, giving much better classification and an appearance of uniformity and symmetry that adds immensely to the general effect. This is, of course, only true in part of the foreign sections.

### THE MACHINERY DEPARTMENT.

In the machinery department things are in a more backward condition than in the industrial section, and it is probable that many exhibits will be incomplete on the day of opening. The blame for this must be borne in part by the management of the exhibition, which was very backward in its work on the building, and partly by exhibitors and their agents. Some important exhibits stand to-day with their boxes unopened, neither exhibitor nor agent having put in an appearance. An order has been issued by the French authorities that all boxes must be removed, and the officers are to-day engaged in doing this when the exhibitors or their agents are not here.

The two lines of shafting running through the American machinery section are driven by two distinct types of engine standing opposite one another, so that the contrast between them is sharply brought out. One is the Straight-Line engine from Syracuse, N. Y., the other built by C. H. Brown & Co., Fitchburg, Mass. They are as different as possible in size and appearance, though both of equal power. They are distinctively American in type. The Brown engine is connected with the shaft by a 20-inch belt, made by the American Leather Link Belt Company, designed to transmit 100 horse-power. This was the first main driving belt in position in Machinery Hall, and attracts much attention. Edison's electrical exhibit is the most prominent and occupies by far the largest space of any in the American section. Among the subjects shown the most prominent are electric lighting, ore separating, electric subways and the phonograph and graphophone. The Thomson-Houston International Company and the Heisler Electric Light Company have also considerable exhibits.

J. A. Fay & Co. have a large and well-arranged exhibit of 27 of their wood-working machines, to be driven by a special engine, with which they are connected by underground shafting. All of the machinery is to be shown doing work. Near them

is an exhibit of the Otis gas engine. The Ingersoll Rock Drill Company will show an air-compressor and other machinery. An important exhibit will be made by the Stiles & Parker Press Company. The American Screw Company will show their new machinery for rolling screws, and it is understood that they will make screws. The Simonds rolling machine will also be in operation. Brown & Sharpe Mfg. Company have a fine line of their machine tools.

In the allotment of space in Machinery Hall the United States has fared better than Great Britain, but in the parts of the exposition devoted to diverse products, called

### THE INDUSTRIAL SECTIONS.

England and her colonies were more generously treated than America. But the United States cannot complain. When William C. Gunnell, Chief of Installation, finished his work at the New York office of the commission and came to Paris to superintend the placing of exhibits, he found that the applications for space from American manufacturers, had they been granted, would have required more than three times the area of floor and wall space allotted to America, and that the work of cutting down and weeding out necessary to get the largest number of firms and best variety of goods in the limited space greatly improves the character and appearance of the United States section. When manufacturers learned how scarce space was and how fortunate they were in getting any reasonable amount, they took more pains and spent more money to fill that space creditably.

The industrial section, which is in the east wing of the main building, and which has for its neighbors Spain, Portugal, Greece, Italy and Sweden, is just now the scene of prodigious work. The chief of the section and a corps of French laborers work late every night, and many of the exhibitors and agents do the same, filling the show-cases and preparing for May 6, the opening day, when the President of the Republic will visit this section. Captain Cochrane and a detachment of marines from Brooklyn Navy Yard arrived a few days ago, and are quartered at the French military school near the exposition grounds. The marines do guard duty day and night in the American section.

The principal exhibits now in place are those of L. & I. J. White, of Buffalo, N. Y., whose case of edge-tools is surmounted with a buffalo's head; A. G. Peck & Co., of Cohoes, N. Y., who have a tall, pyramid-shaped case covered with bright axes, hatchets and picks; J. R. Torrey Razor Company, of Worcester, Mass., who display samples of razor-strops in a large show-case; the American Bit Brace Company, of Buffalo, who have two cases filled with bit, speed and corner braces in many styles, and the Hartford Woven Wire Mattress Company, of Hartford, Conn., who show specimens of wire-weaving. The Enterprise Mfg. Company, of Columbiana, Ohio, have one of their small feed-mills, so constructed as to show the interior mechanism, and the firm of William H. Doppe & Son, of Buffalo, exhibit steam-jacketed kettles for soap, lard and candy-makers, and a section of a kettle showing the hollow casting of the sides.

Messrs. Clark & Wise Company, of Chicago, have built a pyramid of axle grease in various-sized packages, and the Miller Lock Company, of Philadelphia, have put up a pyramid of tin money or bond boxes, showing their keyless locks and their improved gun-metal padlocks. The lower box on which the pyramid stands is large enough to hold several bushels of collaterals.

E. L. Gaylord, of Bridgeport, Conn., has set up a line of foot-power miter-

cutters and planes, used principally by picture-frame manufactures, and Sidney Shepard & Co., of Buffalo, have made a neat little exhibit of hardware specialties. The John C. Jewett Mfg. Company, of the same city, show a handsome refrigerator of quartered oak (which will be used during the exposition by the juries on butter and dairy products) and a fine sample of their New Era water-coolers.

J. E. Smith & Sons, of Buffalo, show a full line of hand and steam power meat choppers.

The Mauris Machine Company, of Philadelphia, formerly the Teal Hoist Company, have furnished for construction purposes and for exhibit one of their patent portable hoists, and Tower & Lyon, of New York, have furnished the Chief of Machinery, Thomas R. Pickering, with a full line of their Stephens patent vises.

George M. Bailey, of Buffalo, has a large space in the industrial section for a collective exhibit of American specialties, and among the firms there represented are Bailey, Farrell & Co., of Pittsburgh, Pa., patent cartridge loaders; George N. Pierce & Co., of Buffalo, children's tricycles and bird cages; the Standard Target Company, of Cleveland, targets and traps; J. D. C. Knapp, of Minneapolis, Minn., patent vaporizers; A. H. Reid, of Philadelphia, the Lightning bit braces; N. A. Osgood, Battle Creek, Mich., a portable boat for tourists' use; Adam Reid, of Buffalo, a combination bake oven for restaurants, &c.

A. E. Foote, of Philadelphia, has a large space devoted to a complete collection of the minerals of the United States. Tiffany & Co., of New York, and the Meriden Britannia Company, of Meriden, Conn., who have the largest space in this section, will exceed all their previous efforts in the elegance and richness of their displays. In the Tiffany space is a fine Herring safe, which will be used by the jewelers and will also be an exhibit.

The Yale & Towne Mfg. Company, of Stamford, Conn., have built a village post-office in front of the office of the United States Commission, on the main aisle, and it will be used by all the Americans connected with the exposition. Near it is the large show-case of the Winchester Repeating Arms Company, of New Haven, Conn., and the space occupied by the United States Government exhibit of military and naval uniforms, meteorological instruments and geographical and geological maps and apparatus used in the departments at Washington.

The Enterprise Mfg. Company, of Philadelphia, show a full line of their hardware specialties in a large space.

Healey & Co., of New York, are among the largest exhibitors of carriages and sleighs in the whole exposition.

The exhibit of type-writers is an important one, the Hammond, Remington and Caligraph companies striving to outdo each other in the elegance of fittings and decorations. The space for these machines is next to that set aside for electrical supplies, where the first Edison phonograph will be shown. The principal exhibits here are of the Okonite Company, of New York, submarine cables and insulated wire; the Thomson-Houston Electric Company, of Boston, dynamos, electrical welding machines and electrical supplies; the Western Electric Company, Chicago and New York, electrical supplies; the American Bell Telephone Company, of New York, long-distance telephones; and the Commercial Cable Company, who show not only samples of their submarine cables, but a beautiful model of their new cable-repair steamer, the Mackay-Bennett.

The Russia Cement Company, Gloucester, Mass., show fish glues and by-products, and George Upton, of Boston, has a large exhibit of glue and sand-paper. Near his space is that of the Richmond



Cedar Works, of Richmond, Va., with a novel and picturesque exhibit of well-buckets, tubs, pails and cedar chests.

The Gorham Mfg. Company, of New York, have a large space fronting on the main aisle and rotunda, filled with silverware in rich and new patterns. On the opposite side of the rotunda are the pretty displays of the Rookwood Pottery Company, of Cincinnati, and of cut-glassware from the works of T. G. Hawkes, Corning, N. Y. These two exhibits are in charge of Davis, Collamore & Co., Limited, of New York. James G. Wilson, of New York, shows venetian blinds and rolling shutters.

Later, by cable, May 8.—At the opening the American sections made a good showing. They are more nearly ready than the French but are not so far advanced as the English exhibitors.

## THE WEEK.

The deplorable accident on the Grand Trunk Railway last week was caused by a broken axle of the engine. An expert was called in to help the jury in its examination.

The recent seizure of Canadian vessels in Behring Sea by the United States authorities for alleged trespass was the occasion of an animated debate in the Parliament at Ottawa, 26th ult., in the course of which Sir John Macdonald explained that it was an international grievance, other vessels than Canadian having suffered damages. For this reason it was not like the fisheries question.

Bishop Potter declares that Plutocracy has no place in the Republic as founded by the fathers, and that now "merchant-able ideas rule the hour."

An effort in the Canadian Parliament to remove the duty of \$2 on saw-logs was defeated, 54 to 90.

United States Consul-General Waller at London received a grand ovation in retiring from his official position. A banquet in his honor, at which Sir John Puleston, M.P., presided, was attended by Col. F. D. Grant, United States Minister to Austria, at least a dozen representatives of consular offices, besides members of Parliament and others variously distinguished, who united in presenting a costly silver cup of an artistic design showing the arms of England and the United States intertwined.

The Philadelphia committee of merchants who have been inquiring into the causes of the diversion of Western freights from that city in favor of Baltimore claim to have discovered that railroads discriminate against Philadelphia to the extent of \$1.87 per ton. The *Record* says: "While the rescuer of the Danmark was at this port several large lots of freight were offered her. One firm asked the Atlantic Transportation Line, the owners of the Missouri, for rates from this city to London. Twenty-two shillings and a half (about \$5.62) a ton, was the answer. At the same time the firm was told that if it would send its goods to Baltimore by water or rail they would be carried from that port to London for 17 1/2 shillings (\$4.37). This was a rate equally prohibitory with that demanded from this port, as freight cannot be carried from here to Baltimore for less than the difference between the two rates." The inducements controlling the action of the railroad in this matter are supposed to be very powerful.

The office of the President of the Board of Health has been filled by the appointment of Chas. G. Wilson, to succeed Mr. Bayles. The *New York Times*, which has long been the stanch advocate of reform

in the manner of official appointments, is pleased to remark: "There is no office for which special qualifications should have been more sedulously sought than that of President of the Board of Health. Under Mr. Bayles the department has been raised out of the mire of politics and has won the confidence of the community. It was of the utmost importance to maintain it in that position. Of the character and general capabilities of Mr. Charles G. Wilson we know little more than is implied in the fact that he is President of the Consolidated Exchange, familiarly known on the Street as the 'big bucket-shop,' but there is not the least reason for supposing that he has any qualifications for the place to which he has been appointed."

Consul Smithers, at Tientsin, reports that the opposition of the Chinese Government to railroad extension has at last been overcome, and China may now be said to have fairly entered upon a career of railroad construction.

The independent oil refineries are said to hold the key to the situation in the Lima oil fields. It is also affirmed that the Lima product makes an excellent illuminant.

Failures in the Boston leather trade since January 1 exceed \$1,500,000, and are attributed to "carrying too large stocks in an unprofitable time and in failing to realize on them until prices had receded so far as to wipe out what capital the concerns possessed." The business is being concentrated in fewer and stronger hands.

A fight against machinery used by shoe manufacturers in the Eastern States has been renewed by the Lasters' Union, but realizing the fact that resistance is hopeless, the object now is to form some plan or agreement by which they may share the benefits derived from the introduction of machinery, either by owning stock in last-machine companies or sharing in the royalty paid for the use of machines. The lasters feel that no association is strong enough to curb the progressive spirit of the centennial year.

The centennial train from New Orleans, with troops on board, made the trip to New York in two days—the fastest time on record.

The Boston superintendent of schools, Edwin R. Scovier, recommends the establishment of a mechanic arts high school, and the project is well received by the Boston press.

The trades school at Cleveland, Ohio, proposed by the Builders' and Dealers' Exchange will be started at once in three branches—namely, plumbing, carpentry and masonry, and preparations are making for the erection of a suitable building. The school will be in session in the evening and open only to boys apprenticed to the trades. The term is for five months, and the tuition will cost about \$35. At the close of the term the scholars will be graduated and become then what are termed "juniors," receiving about \$1.25 or \$1.50 per day. They will become journeymen when their "bosses" think they are capable. The instruction will be of a very practical character. The pupils will be expected to do actual carpenter, plumbing and masonry work and to understand the theory of their work. The plumber apprentices will be required not only to point out the defects of a poor system of sewerage but to describe a good one.

The controversy over the liability to duty of foreign-built cars belonging to Canadian railroads used in the transportation of goods between points in the United States via Canadian territory which is now pending before Assistant Secretary Tichenor was to have a hearing

May 8. If the Treasury Department should adopt an aggressive policy Canada would at once retaliate by levying duty upon or seizing cars built in the United States whenever they enter Canadian territory. This would practically nullify Sections 3005 and 3006 of the Revised Statutes, permitting the transportation in bond of imported merchandise to Canada and Mexico and of all goods between ports of the United States via Canadian or Mexican territory, and would be equivalent, under the present conditions of railroad management, to such a declaration of non-intercourse with Canada as President Cleveland asked Congress to authorize him to declare, which authority Congress declined to vest in the President of the United States.

The Northern Pacific Railroad, by assuming the management of the Wisconsin Central, acquires a line of its own extending from Chicago through to Tacoma. This is by far the longest line in the world under one management.

Acting Secretary Tichenor has informed a correspondent that cutlery tools sent to Montreal for repairs are properly subject to duty on their reimportation into the United States.

James W. Romeyn, consul at Valparaiso, reporting to the Department of State upon the trade and commerce of Chili, comments upon the fact that while imports into Chili in 1887 amounted to \$48,630,000, but \$3,200,000 came from the United States, and that while 15,000 vessels entered and cleared at Chilean ports, the American flag waved over only 221 of them.

The amount of capital invested in the United States in the rubber business is \$25,000,000. There are made every day an average of 150,000 pairs of rubber shoes, or 40,000,000 pairs a year.

Wm. H. T. Hughes, an enthusiast on the subject of extending our export markets in South America as a means of relieving the domestic market of surplus products, contends that we must have ships flying the American colors equal to those of all competitors, and to do this Government subsidies are indispensable. Mr. Hughes says: "We cannot compete with the Europeans, not as it is commonly supposed because it costs us more to build the ships or to run them; no, that is not the main difficulty. The true, the real difficulty lies in that the European lines are subsidized. I am to-day running American steamships in competition with a line subsidized by the Spanish Government, and unless our steamship lines are placed on the same footing competition is out of the question. Why cannot our Government adopt the same policy pursued by the English, the French and the Germans, and subsidize such steamers as may be built in conformity with the requirements necessary to turn them into commerce destroyers in case of emergency? Would this not be a more economical policy than the building and maintaining of a large fleet of special cruisers?"

Governor Washburne, of Minnesota, is of the opinion that the two railroad lines from that State to Sault Ste. Marie, where they will connect with the Canadian Pacific, are destined to do a large freighting business with the Northwest.

On account of the scarcity of glass-blowers in this country manufacturers are attempting to supply themselves from abroad without previous contract. A number have been obtained in this way. At a meeting of the Glass-blowers' Association in Pittsburgh a member from Baltimore announced that two factories in that city are now idle because they cannot get enough blowers to operate

the works. President Campbell said he did not know of any idle glass-blowers in the country that wanted work and were not engaged. The report published that there are 1040 pots in operation and 252 idle may be correct; but that does not indicate that there are idle workmen. Many of these pots, he said, are idle because there are not enough experienced men to operate them, and some of them are not in operation because the works have been burned down.

John Hicks, the new Minister to Peru, sailed on the City of Para for his new station at Lima.

According to a Paris paper Edison has combined the phonograph with the clock in a most ingenious manner. Instead of striking the hour the clock calls out in well-modulated tones, "Dinner time," "One o'clock," "Two o'clock," etc. Workmen will be particularly pleased with a clock that tells them audibly that it's "time to quit."

The building boom in Brooklyn last month was unprecedented. The proposed improvements for which permits were issued will cost upward of \$4,000,000.

The new court-house at Pottsville, Pa., will cost \$200,000, and have walls combining stone, pressed brick, terra-cotta and galvanized iron, with copper and iron cornice and iron beams throughout.

The Post-office Department at Washington will hereafter be closed on Sunday.

At the first annual dinner of the Spanish-American Commercial Union, held in this city last week, J. M. Ceballos presiding, the Secretary of the Interior, John W. Noble, said that it devolved on the merchants of New York City to open up the trade that was awaiting development between the two Americas—North and South. A line of steamships should be established between the United States and the Southern part of the American continent, a rapid, reliable means of communication.

Referring to the material progress of the American people during the past century, the president of Cornell University, in a speech at Pittsburgh, said: "Within this hundred years how has civilization been transformed! When Washington took the oath of office, Watt had just produced that most wonderful of inventions, which not only, as Lord Jeffrey said, could 'draw out without breaking a thread as fine as a gossamer, and lift a ship of war like a bauble in the air,' but was to thrust its myriad arms into the varied activity of life, and so usurp the control of all the industries of the world. George Stephenson, a boy of 8, was learning to read at a night-school in Northumberland, little dreaming at that time of the curious machine with which, just 25 years later, he was to astonish the world by drawing the first train of railway cars at the rate of four miles an hour. Arkwright had, three years before, been knighted by George III for his invention of the spinning-jenny, and Crompton was just reaping the first fruits of his new invention of the power loom. This series of inventions, unparalleled in the history of industry, was just ushering in a new era of material development."

Twenty-two States participating in the Washington centennial were represented by their governors. Since the Yorktown celebration there has never been seen so large an assemblage of American war vessels as was grouped in New York Harbor on the day of the naval parade, April 29. In all there were 11 war ships and four revenue cutters.

Manager Hain, of the Manhattan Elevated Railway, has said that about 2,346,000 fares were taken during the three days

of the Centennial. This is an average of 782,000 a day, and specifically, Monday, 765,000; Tuesday, 825,000; and Wednesday, 756,000. Estimated in dollars the returns were \$117,800. Over 607,000 persons crossed the Brooklyn bridge and 642,000 by the Brooklyn ferries. Altogether, according to the most careful estimates, about 1,800,000 people visited the city. The industrial parade was nearly six hours in passing a given point.

The consolidated gas works in St. Louis will represent an investment of \$9,000,000, for which bonds and stock will be issued to the extent of \$12,500,000.

Vancouver, B. C., the Western terminus of the Canadian Pacific Railway, is a thriving city of 13,000 inhabitants.

It is estimated that the money cost of the celebration in this city was over \$2,000,000. The Centennial Committee disbursed about \$400,000 and the Army Committee from \$100,000 to \$120,000. The State and city appropriations amounted to \$225,000, of which \$125,000 was for the expenses of the National Guard. The cost of the 20 floats furnished directly by the Artists' Committee was \$14,000. The 40 floats supplied by societies and trades cost \$27,000.

The inventor of the Hotchkiss gun, who died in Paris not long ago, left an estate valued at \$12,000,000, which is now disputed by the heirs. The question of domicile, on which the division depends, is the point at issue.

Sir Julian Pauncefote, the new British Minister at Washington, in his formal presentation to the President, said his "utmost endeavors will be devoted to the object which Her Majesty and her people have so much at heart, the maintenance of the relations of peace and friendship which happily subsist between Great Britain and the United States, and the strengthening, if possible, of the many ties which unite these two great English-speaking countries."

American legations in foreign countries will hereafter be augmented by the assignment of a military *attaché*, whose duty will be to make reports upon all military operations, experimental and otherwise, means of defense of the country in which they are residing, military inventions, and in fact upon all military subjects in which this country has any interest.

A prominent banker in Texas, now visiting New York, says the census of 1890 will show that his State has a population of 3,000,000. "The resources of our State are unlimited. They call us a prairie State—yet we have 25,000,000 acres of virgin pine forest. We are a cattle-raising State and a wool-raising State, and still we raise more cotton than any other State. Recent investigations show that we have iron in large quantities in our hills. The hematite ores in the Jefferson and Rusk districts are just being developed, and in the Llano iron district magnetic and specular ores have been discovered assaying 60 to 70 per cent. in large quantities, along with fine beds of manganese."

The stream of immigration across the continent to Washington and Oregon shows no signs of diminishing, and promises to continue all summer.

The Dominion Parliament during the session ended 1st inst. devoted much attention to the subject of steamship subsidies. Between British Columbia ports and China and Japan an improved steamship service was provided for, the Government obtaining from Parliament power to give a subsidy of \$75,000 yearly for a monthly service and of \$125,000 yearly for a fortnightly service, the British Gov-

ernment supplementing these subventions with grants according to the frequency of the voyages. The service to England and Australia was not provided for.

One of the local passenger railways in Philadelphia is having six storage battery electric cars built, the largest to be equipped with two motors of 10 horsepower each, and to be eight-wheeled.

The cotton manufacturers and cotton planters of the South are thoroughly aroused in their opposition to the Jute Trust. The Southern Manufacturers' Association permanently organized in Augusta 1st inst., with H. H. Hickman, of that city, president, and by invitation the Farmers' Alliance, of Georgia and South Carolina, shared in the proceedings. About 50 mills in Georgia and neighboring States were represented, and Augusta was selected as the central headquarters. Contracts were made with the mills for 2,000,000 yards of cotton bagging, to be delivered on August 1.

The competition of the Lake Superior routes with Chicago excites much interest in the West. There is nothing new in the fact that the routes recently opened via Duluth and other Lake Superior ports tap the Northwestern wheat fields, but the importance of changes thus made in the currents of traffic has not been fully comprehended.

The weight and bulk of the gold and silver coin now held by the United States Treasury forms the subject of inquiry by a correspondent of a mathematical turn of mind, and he finds that the weight of the gold is 601 tons of 2000 pounds, and the silver 8009 tons. Packing it along the highway as cord-wood is packed, the gold would make a barricade 4 feet high and 4 feet thick for a distance of 335 feet, and the silver, if similarly packed, would extend 4248 feet, or five-sixths of a mile. If packed in carts, 1 ton to each cart, the procession would be nearly 33 miles long, of which distance the gold-bearing carts would cover 2½ miles and the silver a fraction over 30½ miles.

Major G. J. Lydecker, Corps of Engineers, who was charged with the supervision of work on the Washington Aqueduct tunnel, but failed to detect and correct the shams that were practiced by the contractors, was heavily fined and reprimanded under a decision of the court-martial which had jurisdiction in his case. The President, in approving of the sentence, says the failure of duty is "a discredit to the engineering profession," and entirely inadmissible.

Under the auspices of the French Government a company propose to build a railroad from the new port of Tien-yen, in Tonquin, and along a tributary of the Canton River, opening a territory inhabited by 120,000,000 people, substituting modern means of transportation for caravans and junks.

Real-estate dealers in New York notice a growing disposition on the part of leading business men in the West and South to fix their domicile in this city. For this and other reasons values are firmly held. During the four months ending May 1 \$25,000,000 more of property changed hands in the city and county of New York than during the corresponding months of 1888. Allowing for dullness during the summer solstice, the real-estate market will show a total of transactions for the year 1889 surpassing \$300,000,000—an unprecedented figure. New York has erected during the past four months \$10,000,000 of buildings in excess of the figures for last year.

The Argentine Republic, it is expected, will receive by immigration this year an accession of 370,000 to its population, principally from Italy.

## MANUFACTURING.

## Iron and Steel.

McKeefrey & Hofins, who are operating the Grafton Furnace, at Leetonia, Ohio, were compelled to bank one of the stacks last week on account of a strike of the iron-carriers for more wages, which was refused by the firm. They inform us that they expect to secure new workmen, and will likely put the stack in blast again this week.

On Saturday, the 27th ult., the management of the Jefferson Iron Works, of Steubenville, Ohio, notified all the nailers in their employ operating cold-nail machines that after that date their services would not be required. This action caused about 40 nail machines to be thrown idle. On the following Monday pickled iron was introduced and a portion of the discharged nailers were re-employed, each one to run eight machines.

On Saturday, the 27th ult., the Bellaire Iron Works, of Bellaire, Ohio, arranged a wages scale with their nailers by which the nail factory of the firm, which has been idle for some months, will resume operations in a few days. The scale of wages adopted will be based on the 16-cent card less 38 per cent. on nails  $1\frac{1}{4}$  inches long and under, and  $12\frac{1}{2}$  per cent. deduction from the 16-cent card on all nails over that length. The usual  $12\frac{1}{2}$  per cent. for self-feeders will be taken off before the reductions mentioned are made. No pickled plate will be used. The Laughlin Nail Company, of Wheeling, W. Va., whose factory is located at Martin's Ferry, Ohio, have also notified their nailers that they will have to work on a scale of wages similar to that adopted at Bellaire. It is probable that the men will accept. It is expected that similar action will be taken by every nail concern in the Ohio Valley.

The puddling department of the American Iron and Steel Works of Jones & Laughlins, Limited, at Pittsburgh, is idle because the main shaft of the Corliss engine in it broke last week.

A Sheffield, Ala., dispatch states that the Sheffield and Birmingham Coal, Iron and Railway Company have sold their railroad, extending from Sheffield, Ala., to Jasper, Ala., 87 miles, to Alfred Parrish, of Philadelphia, Pa. Mr. Parrish has named the road the Birmingham, Sheffield and Tennessee River Railway. The three new coke blast-furnaces and the coke ovens, coal mines, &c., on the line of this road, which are owned by the Sheffield and Birmingham Coal, Iron and Railway Company, will continue to be operated by the latter company.

Oliver Bros. & Phillips and the Republic Iron Works, Limited, of Pittsburgh, recently closed the purchase of a large block of territory in the Bellevernon natural gas field, including a well flowing at heavy pressure, and will immediately proceed with the construction of a pipe line to connect their works therewith. The work will be pushed forward to completion as rapidly as possible. Both concerns are now supplied by the Philadelphia Company's line.

The plant of the Cherry Valley Iron Company, at Leetonia, Ohio, resumed operations on April 15 and continued in operation until the 25th, when it closed down in all departments. It is not known when operations will be resumed again.

Adolph Pluemer has been appointed receiver of the Etna Iron Works, of Iron-ton, Ohio, on application of Albert W. Osler and himself. Bond has been fixed at \$25,000, signed by Adolph Pluemer,

Lipman Levy, Herman C. Besuden and John C. Davis. The corporation has not paid the expected 6 per cent. dividend within the last few years, and therefore any one of the last stockholders has the right to pray for a receiver, which prayer was promptly granted in this case.

The entire plant of Brown, Bonnell & Co., at Youngstown, Ohio, closed down last week for a short period for the purpose of making necessary repairs. As soon as these are completed the finishing department will be started up, while the puddling department will be allowed to remain idle until the surplus stock of puddled iron is worked up.

Furnace No. 2, of the Glendon Iron Company, at Easton, Pa., has been blown out for the purpose of being extensively repaired. Furnace No. 3, which has recently been overhauled, has resumed blast.

At the plant of the Bethlehem Iron Company, at Bethlehem, Pa., the largest steam hammer in the world is being set up and two 80-foot annealing furnaces are being erected at the ordnance works.

At the McDonald Rolling Mills, St. Louis, a 3-ton Morgan hammer has been placed in position. Under a pressure of 80 pounds it is capable of giving a blow of 36 tons. It has a 5-foot stroke, and the face room or die is 24 x 14 inches.

From a recent issue of the Reading, Pa., *Times* we take the following: "The P. and R. rail-mill in the northern section of the city has been leased by a party of New York capitalists, who will start the mill as soon as possible and manufacture steel tools. They have a new process of manufacturing steel, and after a number of improvements have been made the mill will be started."

The blast-furnace, engines and other property of the old Duluth Iron Company, at Duluth, Minn., have been sold to satisfy a judgment of \$130,000. In 1883 Walter Mann, of St. Paul, the trustee of the property, purchased 100 \$1000 shares of stock, and when the company stopped business a mortgage and trust were executed to him to make good his interest in the concern. There were no bidders for the property besides Mr. Mann.

The situation of affairs at the works of the Allegheny Bessemer Steel Company, at Duquesne, Pa., where a strike has been in progress for several weeks, is unchanged, but from present appearances a settlement is very near.

The Sharon Iron Company, of Sharon, Pa., are putting in a new battery of boilers. They are also making preparations for erecting a gas furnace for the guide mill. The building of this furnace will equip all their finishing mills with gas furnaces.

The plant of the Western Nail Company, at Belleville, Ill., will be offered for sale on Saturday, the 25th inst., at the court-house at that place.

To supply their hoop-iron trade, P. L. Kimberly & Co., Limited, of Sharon, Pa., have decided to add a new 7-inch train to their plant.

The Meriden Malleable Iron Company, one of the big concerns of Meriden, Conn., is financially embarrassed, owing to several recent failures of Western houses whose notes the company held. The employees in the iron and brass foundries were informed that their services would not be required until further notice. About 250 men are thrown out of work. The gentlemen connected with the firm are all men of integrity, and the company have nothing to conceal. At a meeting of the

directors and prominent stockholders the management presented a statement showing liabilities \$180,000 and assets \$280,000. The only embarrassment was from a lack of ready cash to meet notes, of which \$12,000 has recently come back unpaid owing to the failure of heavy creditors. The assets consist largely of fine buildings built some years ago.

The new charcoal blast-furnace of the Mont Alto Iron Company, at Mont Alto, Pa., was destroyed by fire 80th ult. The furnace was entirely new and had been put into operation only two weeks ago.

Col. Enoch Ensley has purchased the Sheffield Furnace, at Sheffield, Ala., and will put it in blast as early as practicable. The price paid has not been made public. The stack is 75 x 17 feet and was completed and made a run in 1888. The Lady Ensley Furnace at Sheffield, also owned by Colonel Ensley, was started for the first time on April 22. This stack is also 75 x 17 feet. Both furnaces will be supplied by ore from the Ensley mines at Russellville, Franklin County.

Thomas H. Hays, 155 Third avenue, Louisville, Ky., desires to be placed in communication with parties owning a blast-furnace plant capable of producing 75 to 100 tons who are willing to move it to a locality where good coking coal and brown hematite ore are available, within a short distance of a railroad.

The Warren Furnace, at Hackettstown, N. J., is to be blown out on account of the dull state of the iron market. The company have a considerable quantity of iron on hand.

The Susquehanna Rolling Mill, at Columbia, Pa., whose puddlers have been on strike for the last six weeks, partially resumed work on Monday with new hands. The old men were offered places, but refused. The company expect to have the mill running full in two weeks.

Contracts have been let for the building of a furnace at Fort Payne, Ala., by the Fort Payne Coal and Iron Company.

Singer, Nimick & Co., of Pittsburgh, are putting in a Boulton apparatus for making solid-steel ingots, manufactured by the Solid Ingot Company, of Newark, N. J. The apparatus has been in use since December, 1887, at the West Bergen Steel Works of Spaulding & Jennings.

Under the management of H. E. Burt, Minneapolis Furnace, at Black River Falls, has been doing some excellent work. In April in ten days it produced 706 tons, or 70.6 tons per day. For this period the yield of the ores was 52.1 per cent. The consumption of fuel was 1775 pounds of charcoal, braise included, per ton of product, the average limestone charge per ton of output being 290 pounds. The blast temperature averaged 1600°. The furnace went into blast on December 5, 1887, its actual run being 447 days 10 hours. It is estimated that it will run six or eight months longer. Considering the fact that the furnace is only 55 feet high, with 11-foot bosh, its record certainly ranks among the very best.

Carnegie Bros. & Co., Limited, of Pittsburgh, have commenced suit in the courts at Columbus, Ohio, against the Columbus and Eastern Railroad Company to collect the sum of \$65,022.81 claimed to be due for rails and other materials furnished. They ask interest on the sum of \$51,061.37 from March 1, 1889.

The Scranton Steel Company, Scranton, Pa., running only 47 shifts with two of ten converters, made in April 18,303 gross tons of ingots and 15,879 gross tons of

rails. The same company, running only 42 shifts, made 17,086 tons of ingots in March.

The plant of the Newport Iron and Steel Works, at Newport, Ky., was sold at sheriff's sale on the 4th inst. to John W. Schneider, who is supposed to have made the purchase in the interest of sureties for \$100,000 indebtedness of the concern.

#### Machinery.

The National Switch and Signal Company, a recently incorporated company, have leased the buildings formerly occupied by the Iowa Barb Wire Company, South Easton, Pa., and will shortly begin the manufacture of their patent switch system. A switch of the kind the company are to manufacture is in service at the intersection of the Lehigh Valley's Roselle Branch. Another is ready to be put in at Packerton, and a third is to go in at the cotton factory at South Easton. W. A. Wilbur, of South Bethlehem; Richard Caffrey, of White Haven, and W. F. Pascoe, of South Easton, are among the directors of the company.

The Union Switch and Signal Company, of Pittsburgh, have greatly improved their facilities for capacity at their works at Swissvale, and are employing 200 hands in the shops, in addition to about the same number on the road erecting plants. The most recent, and probably the largest, pneumatic plant of this kind ever ordered is now being built by this company for use at the Union Depot and yards at Kansas City, Mo. It will be ready for operation in about 90 days.

The Machinists' Supply Company have removed to 167 and 169 Lake street, Chicago, to secure more room for their growing business. They carry a full stock of machinists' tools, lathes, drills, &c., and their enlarged quarters will enable them to handle a much greater variety of such goods than they were able to keep in their former location.

The Altoona Mfg. Company, of Altoona, Pa., are putting in two 48-inch x 25-foot boilers, and two 100 horse-power rope-hauling engines for the New York and Cleveland Gas-Coal Company, at Turtle Creek, Pa.

Increased business and the necessity of more ample accommodations have caused B. F. Sturtevant, manufacturer of blowers, heating apparatus, engines, &c., to move his New York branch office to No. 91 Liberty street, where he will be better able to meet the trade. He has also recently established a branch at Portland, Ore., under the management of O. C. Gove, who will handle the rapidly-increasing trade of the Pacific Coast.

The Trenton Iron Company, at Trenton, N. J., are so crowded with orders for their locked wire rope that they are building a second machine. They have also added recently a large machine shop to their plant.

Bids were opened at the Navy Department on the 1st inst. for supplying the machinery of the battle-ship Texas, now building at the Norfolk Navy Yard. The bids were: Richmond Locomotive and Machine Works, \$634,000; N. F. Palmer, Jr., & Co., of New York (Quintard Iron Works), \$682,500; Southwark Foundry and Machine Company, of Philadelphia, \$645,800; Charles Reeder & Sons, Baltimore, \$718,900. The I. P. Morris Company, of Philadelphia, put in a bid of \$694,750 for constructing the machinery according to the Department designs but with their own modifications.

T. William Harris & Co., of 44 Broadway, New York, have the contract for the construction of the Eleventh Ward Street Railway in Syracuse, N. Y. They

have a large force of men, and the work is being rapidly pushed forward.

The Buffalo Steam Pump Company, Buffalo, N. Y., have opened an office in the Commerce Building, St. Louis, Mo. Theodore Allen, Mem. Am. Soc. C. E., has been appointed manager, and will have charge of the territory south of the Missouri line and west of the Ohio line to the Pacific Coast.

Among the recent sales of the Curtis Regulator Company is an 8-inch steam separator for the Tremont Nail Company, of West Wareham, Mass. This is the third large separator they have furnished for these works. They are also making a 10-inch separator for the Alexandria Bay and Thousand Islands Steamboat Company, Carthage, N. Y. Each separator is provided with a balance-trap that automatically delivers the condensation into the hot well.

The Brown & Sharpe Mfg. Company and Darling, Brown & Sharpe have recently issued in pocket size a very complete illustrated catalogue showing the apparatus manufactured by them. The first portion of the book is devoted to the Brown & Sharpe line of milling machines, grinding machines, automatic gear cutters, engine and hand lathes and milling cutters, and also calipers and gauges, for which this firm have earned such a widespread reputation. The Darling, Brown & Sharpe portion of the catalogue shows graduated scales of improved form, gauges and calipers of various kinds. A copy of this catalogue will be furnished on application, and will be found to contain much matter of interest in addition to the descriptions and illustrations of the tools manufactured.

J. A. & S. F. Dunkle, of Steelton, Pa., and J. B. Ewing, of Harrisburg, Pa., have bought the entire plant and goodwill of the Star Steam Heater Company, of Mount Joy, Pa., including the exclusive control of the patents. Large and commodious shops will at once be built at East End, Harrisburg, Pa., according to new plans especially adapted for their business. Three departments—viz., boiler-making, machine and foundry—will be fully fitted out with the best machinery. It is expected that the shops will be completed some time during July, when they will immediately be occupied. Meanwhile operations have begun in the old shops in Mount Joy, where work is being pushed to its utmost to supply the demand. The address of the firm is Star Steam Heater Company, Harrisburg, Pa., or until after August 1 Mount Joy, Pa. H. H. Lindemuth, the patentee, has connected himself with the new firm and will give the boilers his personal supervision.

The Thomson-Houston Company, of Boston, have been obliged to greatly increase their facilities in order to handle their rapidly-growing business in electric railways. In addition to the large contracts closed some time ago they have lately obtained the following: Lynn and Boston Railroad Company, from Central Square to Nahant House, Nahant, 4300 feet of track; Newburyport and Amesbury Horse Railway Company, Newburyport, Mass., a line about 6 miles in length, and made up almost entirely of curves and grades, the maximum being 10 per cent.; the Newton Circuit line, Newton, Mass., 8 miles in length, from Newton to Watertown; the Plymouth and Kingston Railway Company, Plymouth, Mass., 4 miles in length, from Chiltonville through Plymouth to Kingston; Quincy Street Railway, Quincy, Mass., 5 miles in length, from Quincy through Wollaston Heights and Atlantic to the Neponset River. The company have also constructed a track of about 1 mile for the Hillside Coal Company, at Scranton, Pa., on which a 40-horse-power

electric motor is used for carrying coal, capable of carrying about 20 cars loaded with 1 ton each. These roads will use altogether some 22 motors. Orders have also been received for new cars from many of the roads already in operation. Work is progressing rapidly on all the roads which the company have under contract, and it is expected that very soon some of them will be put into operation.

#### Hardware.

A charter was filed in the Recorder's office at Pittsburgh last week for the Pittsburgh Electric Scale Company. The capital stock of the company is \$10,000, divided into 100 shares at \$100 per share. The directors are M. W. Rankin, John W. Nevin, Charles E. Billin, W. F. Bickel, I. S. Reymer, R. B. Petty and F. G. Paulson.

E. C. Atkins & Co., Indianapolis, Ind., write, under date of 3d inst., that business in their circular and band saw departments is good, being considerably behind in their orders. They also advise us that they have just established an agency at Minneapolis, Minn., with repair works, and purpose to carry a full stock of saws, and later to do an extensive business there in mill supplies.

The Maryland Tack Company, Baltimore, Md., are reported to be meeting with good success under the new organization. Their larger plant, modern and extended facilities, additional machinery already in and arriving and improved methods of manufacture are all due to as putting them in a position to make with advantage an excellent quality of goods.

The Akron Hardware Company, Akron, Ohio, have been reorganized, and, we are advised, with increased capacity. They manufacture a line of metal and glass rosettes, crystal and metal front hubbands, steel-mouth, hand-forged bridlebits in a variety of finishes, whip sockets, spurs, buggy seat handles and a line of saddlery specialties.

A recent issue of the *British Ironmonger* contains the following reference to the business of A. J. Jordan, St. Louis and Sheffield, an enterprise of exceptional interest, as that of an American manufacturer making his goods in England:

Mr. A. J. Jordan is well employed in his specialties of fine pocket cutlery, of which increasing consignments are being made to the United States. The tendency is decidedly in favor of the highest qualities, the plainer descriptions, such as a good, plain pocket-knife, with a serviceable blade and cheap handle, being less inquired after by Mr. Jordan's American customers. He is also meeting a growing demand in the States for his fine Sheffield razors, put up in cases, while on the other hand his English trade for the American Star safety razor is also well maintained. The United States demand for Mr. Jordan's specialties in fine case goods, such as ladies' companions, caskets and similar goods, is very active. Recently Mr. Jordan completed for private presentation a case of carvers deserving of more than passing notice. A feature in this instance was the mother-of-pearl handle of the carver, which was made of one of the largest pieces of mother-of-pearl that has been dealt with in Sheffield. Indeed, those who saw the mother-of-pearl declared that if the country had been searched through there could not be found another piece to equal it.

Raymond Lead Company, Chicago, Ill., have added to their other departments the manufacture of a line of mixed metals, including babbitt, solder, electrotype, stereotype and type metals, ingot brass of all grades, and a variety of special mixtures. For the accommodation and successful handling of this undertaking they have enlarged their facilities and added new machinery of the latest improved pattern, which gives them a very complete plant. This department will be under the personal control of Frank R. Cargill, former manager of the mixed metal department of E. W. Blatchford & Co.



# The Iron Age

New York, Thursday, May 9, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

The Chicago editorial and business offices of *The Iron Age* have been removed from 95 and 97 Washington street to 59 Dearborn street.

## The Duty on Mexican Lead-Silver Ores.

In a week from now a very important hearing will take place at the Treasury Department in Washington on the admission free of duty of the lead contents of foreign silver ores. Great interests are likely to be arrayed on both sides of the question, the decision of which will have a direct effect upon the markets of the base metal. In fact, the price of lead has already stiffened.

A brief review of the leading features of our lead-smelting industry will be necessary to point out in which manner different interests are affected by a possible change in the present ruling. The lead-mining industry is generally classed in two great groups, that of the Missouri and Kansas, making a product practically free from silver, and that of the Rocky Mountains, closely allied with silver mining and extraction. The first, which turns out annually from 25,000 to 30,000 tons of metal, is not directly interested, except to the extent to which a lessening of imports is likely to create higher prices.

In the Rocky Mountains the interests are more complex. We have first the owners of the lead mines and the communities dependent upon them. Then a certain large number of silver mines, large and small. A third interest are the smelters, and a fourth the desilverizers and refiners. Back of them all are the railroad companies, some of whose directors are also individually identified with smelting or desilverizing enterprises. The owners of lead mines throughout the Rocky Mountains are, of course, very anxious that the free importation of lead in ores should stop. The position of the others mentioned is dependent upon their location geographically. American silver ores are purchased in large quantities by the lead smelters in the Rocky Mountains, to be treated together with the lead-bearing ores. The base metal is merely, so far as the metallurgical operation is concerned, a carrier of the precious metal. The silver in the ore alloys with the lead and is thus extracted cheaply and completely, where other methods would not answer so well. On the whole, the quantity of the "dry" ores not containing lead is in excessive supply, so that the majority of the smelters are eager competitors for lead ores. The result is that the price paid for the base metal in the ore is very close to what it will fetch in the market, adding freights and allowances for waste, &c. The profits of the smelters must therefore come from the "dry" ores. If the lead market is low or is largely supplied

from any locality too far distant from them as a possible source of supply, then the amount of lead ore offered to them must decrease. The smelters of that particular locality must either pay relatively high prices for the lead in the ore, as compared with what they can get for it when they have run it into bars, or they must restrict their operations and squeeze the miners of dry ore harder. The owners of silver mines which yield these "dry" ores are, of course, directly affected by whatever benefits the interests of their local smelters. Within this category come the entire lead and silver mining and smelting interests of Montana, Idaho, Colorado and Utah.

In the Southwest the situation is different. The lead-mining interests of Arizona and New Mexico thus far are unimportant. The smelting interests, relatively greater, are based very largely upon the imports of Mexican ores. They come in under the present interpretation of the law which classifies as a silver ore, free of duty, any ore the chief component of value of which is silver, no matter how much lead it may contain. These interests will be found very vigorous opponents of any change, and are likely to have the sympathy and support of the silver miners in New Mexico and Arizona who are their customers.

A third group of interests is represented by the lead desilverizers at Omaha, Kansas City, Aurora, Ill., and St. Louis. All of them are to a greater or less degree smelters of ore also. Two of them handle a very considerable quantity of Mexican ore, and, that part of their business preponderating, may be found in the ranks of the opponents of any change. One of them, besides, is identified with the National Lead Trust, which embraces about 60 per cent. of the whole production of white lead. With them cheap raw material may prove a potent reason for an attitude of opposition. It is likely, too, that manufacturers of sheet lead, pipe and shot will incline in the same direction.

A very powerful interest sharply divided will be the railroads. Those which penetrate from Missouri River points into Montana, Idaho, Colorado and Utah will vigorously demand justice, among them being the Northern Pacific, Manitoba, Union Pacific, Central Pacific and Chicago, Burlington and Quincy, the directors of some of them being personally interested in the industry. The Mexican roads and those American lines having a greater or less identity of interests with them will be arrayed on the other side.

We may finally note that a small group of men will watch the proceedings with the keen expectation which grows out of the hope of getting out of a very bad bargain scared but unscathed. We allude to the bankers and dealers who had confidence enough in the genius of the fallen lead king to advance 4 cents on upward of 12,000 tons of lead. The metal has hung about 3.75 cents ever since the collapse, so that they seemed hopelessly stranded. If the importation, free of duty, of lead in Mexican silver-lead ores can be stopped they may expect to recover their advances and possibly secure fair interest, too.

There are strong forces arrayed on both sides of the question, and whatever merits

there are in it, pro and con, will probably be brought out. The weight of influence appears to be with those who claim that it is unfair to call a 50 per cent. lead ore a silver ore because it happens to carry also 50 ounces, or 0.16 per cent., of silver. One point may be touched upon during the hearing, and that is to what extent fraud has entered into this business. It is charged that in Mexican sampling works enough rich silver ore is added to lead ores deficient in the precious metal to carry them up to the requirements. How easy such doctoring would be, and how difficult of detection, may be easily appreciated.

## Trusts in Canada.

The popular voice clamors against so-called trust combinations among tradesmen, and in the case of the Sugar Trust the courts have branded it with the stamp of illegality. Yet so far it would appear that no effective measures can be devised to suppress an evil pregnant with the worst possibilities. While the whole subject thus seems to remain in abeyance so far as concerns the United States, we may obtain a more complete appreciation of the deplorable consequences which befall a community—the helpless humiliation and enslavement which may be entailed through the prevalence of trust organizations—by turning on the side-lights. To do this we need not go further than the neighboring Dominion of Canada. There trusts are experienced in their most aggravated features, so that as a matter of fact a man's dead body cannot be decently interred until the survivors have paid blood-money to the undertakers' trusts, who dictate the terms upon which this privilege may be granted. Neither can he have coal to keep himself from freezing, nor salt, nor provisions and food for his subsistence until he has paid the precise amount of tribute agreed upon by the ring who corner the entire available supplies of these classes of merchandise. At last there is a popular revolt against these exactions, and from the tone of the recent debates in Parliament it would appear that the general sentiment is almost unanimous in favoring a bill for their suppression, introduced by N. Clarke Wallace, M.P. It was ascertained, however, before the adjournment last week that an obstruction existed of a formidable character. From some source it was plainly intimated that there could be no further "contributions to the election funds" if the bill was permitted to pass.

The bill provided, among other things, heavy penalties against every person who agrees or arranges with any other person or with any railway or transportation company unlawfully to limit the facilities for transporting, producing, manufacturing or dealing in any commodity which may be a subject of trade and commerce, or to restrain or injure trade or commerce in relation to any such article or commodity. The bill was finally shelved in the Committee on Banking and Commerce.

The circumstances provoking legislation of this character may be gathered from one of the speeches directed against combinations in restraint of trade. It was stated that in Ottawa, the capital city, three men controlled the entire business of importing or selling coal. In Toronto a similar combination existed, which placed

dealers under surveillance and required oaths of fidelity from all in their employ. In cases where the Dominion or the local Government or charitable or public institutions asked for tenders for the supply of coal, the coal ring decided what price should be demanded, and they put up at auction to the members the privilege of supplying the coal at those prices. In some instances as much as \$1500 was paid as a bonus for the privilege thus secured.

Again, the wholesale grocers' guild agreed with the sugar refiners that the latter should sell their product to members of the guild at an advantage as compared with all others, the prices to retailers being definitely fixed. This arrangement proved to be so satisfactory that the guild extended the combination in other directions, securing large profits from the sale of tobacco, starch, &c., and excluding others from all participation, except at advanced prices. Manufacturers of binders' twine in like manner formed a combination to regulate prices and output, advancing prices 50 per cent. as compared with last year. Respecting the coffin business, Mr. Wallace made the following extraordinary statement: "The coffin-makers and manufacturers of coffin supplies had undertaken to sell to none but members of the Undertakers' Association. In order to become a member of the Undertakers' Association, a man had to get the consent of three out of four of the nearest undertakers living to him; of course in a small town that was impossible. The result was, as we have evidence before the committee to prove, that they became a close corporation and nobody could enter the business. Their freedom was interfered with and they could not enter into the business of undertaking, because the manufacturers of coffins and of coffin-makers' supplies were prevented from selling them goods." The trust problem is enviroined with difficulties, as abundantly demonstrated both in the Dominion and in the United States, in New York City as well as in Congress. In Europe it is no nearer a solution. But there are limits beyond which "legalized robbery" will not be permitted.

"It is an ill wind that blows nobody good," and the adage is being exemplified in the present era of depression in the iron trade. Those who are building new blast-furnaces, rolling-mills and steel-works have struck a most fortunate season for pushing their undertakings. They will be able to erect their buildings and install their machinery at perhaps a lower cost than ever before in the history of this country. Some of the contracts of this character which have recently come under our notice have been placed at marvelously low prices. This applies no less to brick and other building material than to the part of the structure into which iron and steel enter. The depression of prices appears to be universal. With respect to machinery a given plant may absorb as much capital as ever, but the character of the equipment will be of the most advanced type and will embrace appliances and labor-saving devices which but a short time since would have required the investment of a much larger amount of money. It is a good time to build new works, to improve old ones and to expand generally in directions and in localities in which a reasonable hope of a more pros-

perous future affords a basis for such operations. The time will come, and it may be soon at hand, when the facilities of production will again be taxed to meet the requirements of our growing country. The use of iron and steel is not going out of fashion, and there may be room early in the future for new works even in the branches of the trade which are now most seriously depressed and are suffering from what we so naturally term overproduction.

#### The New Silver Coinage and Recoinage in China.

Should all the governments that have been invited attend the same, the congress of all American nations will assemble at Washington in October next, and among the common measures proposed the one of an international silver coin is likely to be adopted. The question will then arise what silver dollar and fractional coin will best recommend itself not only for circulation in the New World, but also for trade purposes in East India, Japan and China, in view of the rapidly-growing commerce between the American West Coast and Asiatic countries named. The Mexican dollar has for more than 60 years been the universally accepted and most popular silver coin in this American Asiatic traffic, because of its reliableness and uniformity. It is bought and sold in the London market in enormous amounts for shipment to the far East, and untold millions of it circulate in China in a disfigured state, being stamped with Chinese characters, both Government and private. Now, however, the Chinese themselves begin to look upon the Mexican dollar with less favor, even in its untarnished condition as it emanates from the Mexican mint, because of its clumsy appearance. They have been studying this monetary question all the more seriously and thoroughly for a year past, as they want to make a change, and a general reform of their system of coin circulation has been resolved upon. They have adopted a silver dollar and fractional coin of their own, beginning with the Kwang-tung province, which is to be the first to receive a sufficient supply.

A large mint has been ordered from Ralph Heaton & Sons, Birmingham, England, and erected at Canton, where, with 90 coinage stamping-presses in operation, it is at present turning out daily 2,700,000 "cash" pieces, together with silver coin for the province named. The so-called "cash," or "li," as this brass coin is called in China, is being turned out to take the place of the old cast "cash," now being withdrawn from circulation, 1000 cash representing a silver dollar, and each being perforated—like the old—with a square hole. This new coin is of a better composition and superior impression, elegant in appearance, and resembling the new "papeques" which France is coining for Cochin China.

The new Chinese dollar has also taken the place of the new "piastre du commerce" which France has coined for Indo-China for a model, and has nearly the same weight; it weighs 27.27 grams, while the Franco-Asiatic dollar weighs 27.21. The Chinese dollar bears on one side the image of the dragon, and on the reverse Chinese characters encircled by the English words: "Kwang-tung Province, 7 mace and 3 candareens." The weight corresponds to

420.88 grains. The fractional coin is of the same standard, thus:

	Grains.
1 dollar, 7 mace, 3 candareens	= 27.27
1/2 " " " " " "	= 13.63
20 cents, 1 " " " "	= 5.46
10 " " " " " "	= 2.73

The new coin compares with others as follows:

	Grains.	Fine.	Grains fine.
Chinese dollar	420.88	0.900	378.8
Old Mexican dollar	415.68	0.901	374.5
New Mexican dollar	415.68	0.902 1/2	375.2
Old Japanese yen	420	0.900	378.2
New Japanese yen	418	0.900	374.4
Hong-Kong dollar	418	0.900	374.4
Franco-Asiatic	420	0.900	378.4

While the disfigured Mexican dollars are to be demonetized and recoined, the question will arise what amount of silver China will have to buy in the world's markets to complete her monetary system, and when the Chinese demand will have to be filled. At this point all remains uncertain. The coinage of a fractional coin of the same standard with the dollar itself is a novel and commendable feature, and in this respect nearly all nations have sinned hitherto, in spite of the fact that a base fractional silver coin is acknowledged to be a nuisance by all. If the new international silver dollar to be adopted by the congress of all American nations were to be made to conform to the Chinese standard and weight, and thus be capable of filling in Pacific intercourse the rank which the Mexican dollar has occupied and still holds to a certain extent, there would be the practical advantage, not to be underrated, of having a coin available for an enormous circulation in and out of the New World. There would be a market for it in New York, London and the Asiatic money centers.

#### Low-Grade Pig-Iron in Foundries.

It is interesting to note the change which the progress of the times is making in the pig-iron trade. One of the most remarkable is the utilization of low grades for foundry purposes. But a few years since it was a serious problem with the owners of a blast-furnace remote from rolling-mills what to do with the pig not classed as foundry iron which they would at times unavoidably produce. Mill or gray forge and mottled iron were scornfully rejected by the vast majority of foundrymen, because castings for general uses could not be made from those grades, which therefore had to be shipped long distances to rolling-mills or pipe foundries and seldom realized cost to the makers. This feature of the pig-iron trade was a hindrance to the development of the blast-furnace industry *per se* at such locations as Chicago, for instance, where the conditions have been constantly growing more favorable for the manufacture every year. A limited quantity of low-grade pig-iron could, of course, be absorbed by the local demand, but a very slight excess produced a glut which had to be worked off at considerable trouble. It was supposed that this condition of affairs would only be remedied by the establishment of pipe-works or rolling-mills in the vicinity of the furnaces. But the problem has been solved and a remedy found, and of late the demand from foundrymen has run so heavily to low-grade and consequently cheap pig-iron that the distinction which once existed between it and the so-called foundry grades bids fair to be almost obliterated. There are many Western furnaces which

now have on their books orders from foundrymen exclusively, covering their entire production of mill iron for months, while their foundry iron is neglected. This is, of course, due to the widespread use of ferro-silicon or high-silicon pig-iron as a mixture with the cheap low-grade iron, by which castings of as good quality are produced as if made from strictly foundry pig-iron. Even the mottled irons of the South, which have invariably been sold below cost to get them out of the way, are being hunted up, so far as such a phrase is applicable in the present depressed condition of the iron trade generally. Western consumers are seeking them because they know now how to use them to advantage in making a cheap mixture and yet secure castings that will prove satisfactory for the purposes intended. The innovation which has thus been made in foundry practice is an inestimable boon to furnacemen. It is not only very important to owners of furnaces located far from rolling-mills and pipe-works, but it seems to have developed just at the right time to open a new channel for the consumption of grades of pig-iron which would otherwise have heavily depreciated in value through the continuous displacement of puddled iron by steel.

The action of the anthracite coal roads in reducing the rates of anthracite coal to the mills and furnaces of their section, the Pittsburgh *Dispatch* remarks, looks like a practical confession of the assertion that the burden of excessive railroad rates levied upon the iron industry of Eastern Pennsylvania by the anthracite pool has been the cause of the failures in that industry.

#### The Blast-Furnaces on May 1.

The long-continued depression in the iron trade has at last begun to tell on the quantity being currently produced, a decline in the capacity of the coke and anthracite furnaces of over 4000 tons a week having taken place in April, in spite of the fact that three new furnaces made their first cast of iron in Alabama during the month. A further decline, notably in the anthracite furnaces, may be looked forward to as the result of the leveling down of prices at tidewater markets to the parity of Western values. It is probably not known generally that there are actually a number of furnaces still in blast east of the Alleghany Mountains whose monthly product ranges between 500 and 1000 tons, or less than any modern stack makes in a week. The majority of these antiquated plants must go and are likely to stop very soon.

On the 1st of the current month the status of the anthracite furnaces was as follows:

Anthracite Furnaces May 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	24	12	3,917	12	3,841
New Jersey.....	14	5	2,061	9	3,410
Spiegel.....	3	3	218	0	0
Pennsylvania:					
Lehigh Valley....	46	23	8,460	23	8,063
Spiegel.....	1	1	75	0	0
Schuylkill Valley..	32	19	6,882	13	3,841
U. S. Susquehanna Valley.....	17	9	3,184	8	1,293
Lebanon Valley....	16	13	6,498	3	1,233
L. S. Susquehanna Valley.....	21	10	4,020	11	2,788
Total.....	174	95	35,315	79	24,019

For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
May 1.....	85	35,315
April 1.....	102	37,977
March 1.....	103	37,967
February 1.....	107	39,187
January 1, 1899.....	107	38,728
December 1, 1898.....	99	34,879
November 1.....	95	33,645
October 1.....	95	33,728
September 1.....	92	33,541
August 1.....	93	33,807
July 1.....	92	32,478
June 1.....	99	32,418
May 1.....	96	31,008
April 1.....	94	30,496

Crown Point has been added to the furnaces at work in New York, having blown in on Bessemer on the 23d ult. In New Jersey the same five furnaces are running. Warren, however, as we are officially informed, will blow out on the 1st of June. In the Schuylkill Valley current capacity has been lessened by the stoppage of No. 1 Phoenix and Brooke No. 3 for repairs, and the blowing out of the two Reading stacks. One of the producers of the valley writes that he does not expect to blow in again in competition with Southern manufacturers until costs have been radically reduced. He states that it is a question of being able to make iron at \$18.50 per ton or abandon the business. In the Lehigh Valley the Allentown Iron Works are running only one furnace, but Bethlehem is now producing with three.

Danville, in the Upper Susquehanna, was banked on the 4th, and Irondale stopped on the 2d ult.; still, the large product of the five Lackawanna stacks went far toward compensating for this falling off, the April output having been 14,803 tons, against 16,138 tons in March for the same district. While we need note no changes in the Lower Susquehanna district, we may report an increase in the Lebanon Valley, through the blowing in of the second Bird Coleman early in April.

The month opened with the following capacity working:

Coke Furnaces May 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,127	2	2,350
Pennsylvania:					
Pittsburgh district.....	18	17	30,557	1	800
Spiegel.....	1	1	539	0	0
Shenango Valley.....	19	16	11,233	3	1,706
Junata and Conemaugh Valley.....	18	12	5,890	6	2,150
Spiegel.....	1	0	0	1	430
Youghl. Valley.....	5	4	1,622	1	790
Miscellaneous.....	4	4	2,336	0	0
Maryland.....	1	1	179	0	0
West Virginia.....	6	3	2,418	3	498
Ohio:					
Mahoning Valley..	14	11	8,413	3	2,025
Central and Northern.....	16	11	7,956	5	3,514
Hooking Valley....	14	4	1,299	10	3,345
Hanging Rock.....	13	8	1,320	5	1,210
Indiana.....	12	1	235	1	154
Illinois.....	12	7	8,070	5	3,925
Spiegel.....	1	1	468	0	0
Wisconsin.....	4	2	823	2	850
Missouri.....	6	2	1,094	4	2,218
Colorado.....	2	1	490	1	450
The South:					
Virginia.....	11	8	3,896	3	1,471
Kentucky.....	4	3	837	1	330
Alabama.....	26	19	12,119	7	3,421
Tennessee.....	11	9	4,332	2	790
Georgia.....	2	1	501	1	810
Total.....	214	147	98,399	67	31,465

As compared with previous months these figures stand as follows:

	No. of furnaces.	Capacity per week.
May 1.....	147	98,399
April 1.....	151	100,080
March 1.....	150	100,737
February 1.....	150	98,518
January 1, 1899.....	157	108,728
December 1, 1898.....	151	101,736
November 1.....	146	94,695
October 1.....	137	85,481
September 1.....	133	81,082
August 1.....	122	74,855
July 1.....	121	69,549

June 1.....	128	75,497
May 1.....	130	76,835
April 1.....	136	79,644
March 1.....	125	68,282
February 1.....	126	73,912
January 1.....	143	88,101

There is nothing of interest to report concerning the furnaces of the Pittsburgh district. Work is being pushed on the new stack of Laughlin & Co. and on the new furnaces of the Carrie Furnace Company, the first to be ready, if possible, on the 15th of June and the latter on the 1st of August. From the other coke districts of Pennsylvania there is nothing to report.

In the Hocking Valley, Baird, Bessie, Glasgow and Winona were the only plants producing, Fannie having gone out and New York having been banked on the 19th ult. The total product in April of the district was 8146 tons, against 8945 tons in March, aggregating the returns from every active plant. In Illinois the same furnaces are at work, their April product having been 36,569 tons, as compared with 35,904 tons in March, including Spiegel. In Wisconsin both of the Bay View stacks are turning out iron; on the other hand, however, Mayville stopped work in April. In Missouri two furnaces only are producing iron. Vigo, in Indiana, is to blow out this month, the plan being to rebuild and enlarge, so that the furnace is likely to remain idle until the fall. In the case of the three States last named we have official returns of product, upon which the capacity figures are based.

In the South April has been eventful. Three new furnaces, the second De Bardelieben, the Lady Ensley and the Trussville have resumed, so that now the number of active furnaces carried on the list is 26. A number of furnaces are out, however—the Bibb, Edwards, Gadsden, Mary Pratt, Sheffield, No. 2 Ensley and Williamson. The latter is to finish repairs at an early date, and has probably blown in before our report reaches our readers. Among the new furnaces completed or nearing completion are two at Sheffield, two at Florence and two at Anniston. In Georgia Rising Fawn resumed on the 29th ult.

## CORRESPONDENCE.

### The National Wire Gauge.

To the Editor: The number of differently-named gauges has long been a source of annoyance and vexation to both buyers and sellers of wire. From time to time manufacturers of wire, and sometimes even merchants, have had made for themselves individual gauges bearing their own or some fancied name. These various gauges have all been practically the same as to sizes and numbers, but differed entirely from the Brown & Sharpe American wire gauge or the Stubs gauge. Many disputes and much unpleasantness have resulted from the lack of a knowledge of this difference.

So great has this multiplicity of standards grown that to-day the specification of the number of a wire carries with it no knowledge of the size unless accompanied by a statement of the gauge used. Having suffered much annoyance from this chaotic condition of things and believing the time ripe for at least a partial correction, we have after a somewhat wide correspondence concluded to submit the following, since it is of interest to a large number of your readers:

All of the wire manufacturers of the United States, with the exception of a few firms, have expressed themselves in favor of adopting a universal name for the gauge which all use in common though under various designations. The majority having expressed themselves at the same time in favor of the name "National Wire Gauge," and the others agreeing to abide by the decision of the majority, all have

agreed in future—with the few exceptions alluded to—use the term "National Wire Gauge" in giving sizes of wire.

The following are the firms agreeing to the foregoing:

Cleveland Rolling Mill Company.  
American Wire Company.  
Oliver & Roberts Wire Company.  
Carnegie, Phipps & Co.  
Gautier Steel Department, Cambria Iron Company.  
St. Louis Wire Mill Company.  
Lambert & Bishop Wire Fence Company.  
Stewart & Co.  
Worcester Wire Company.  
Geo. W. Prentiss & Co.  
R. H. Wolff.  
H. Belmer & Co.  
Iowa Barb Wire Company.

We append a table of the adopted gauge, showing sizes and diameters from 7/0 to 36; also tables of diameters of American and Stubs' numbers corresponding:

National Wire Gauge.				Number.	Birmingham gauge (Stubs').	American, (Brown & Sharpe's) gauge.
Gauge numbers.	Diameter, inches.	Weight of 100 feet, Pounds.	Weight of one mile, Pounds.			
7/0	0.490	63.63	3360	...	...	...
6/0	0.460	56.10	2962	...	...	...
5/0	0.430	49.01	2588	...	...	...
4/0	0.393	40.94	2162	0000	0.454	0.46
3/0	0.362	34.73	1834	000	0.425	0.40964
2/0	0.331	29.04	1533	00	0.380	0.3648
1/0	0.307	27.66	1460	0	0.340	0.32486
1	0.283	21.23	1121	1	0.300	0.2893
2	0.263	18.34	968	2	0.284	0.25763
3	0.244	15.78	833	3	0.259	0.22942
4	0.225	13.39	707	4	0.238	0.20431
5	0.207	11.35	599	5	0.220	0.18194
6	0.192	9.73	514	6	0.203	0.16202
7	0.177	8.03	439	7	0.180	0.14428
8	0.162	6.96	367	8	0.165	0.12849
9	0.148	5.08	306	9	0.148	0.11443
10	0.135	4.33	255	10	0.134	0.10189
11	0.120	3.82	202	11	0.120	0.090742
12	0.105	2.92	154	12	0.109	0.080808
13	0.092	2.24	118	13	0.095	0.071961
14	0.080	1.69	89	14	0.083	0.064084
15	0.072	1.37	72	15	0.072	0.057068
16	0.063	1.05	55	16	0.065	0.05082
17	0.054	0.77	41	17	0.058	0.045257
18	0.047	0.58	31	18	0.049	0.040303
19	0.041	0.45	24	19	0.042	0.03589
20	0.035	0.32	17	20	0.035	0.031961
21	0.032	0.27	14	21	0.032	0.028462
22	0.028	0.21	11	22	0.028	0.025347
23	0.025	0.175	9.24	23	0.025	0.022571
24	0.023	0.140	7.39	24	0.022	0.0201
25	0.020	0.116	6.124	25	0.020	0.0179
26	0.018	0.093	4.91	26	0.018	0.01594
27	0.017	0.083	4.382	27	0.016	0.014195
28	0.016	0.074	3.907	28	0.014	0.012641
29	0.015	0.061	3.22	29	0.013	0.011257
30	0.014	0.054	2.851	30	0.012	0.010025
31	0.0135	0.050	2.64	31	0.010	0.008928
32	0.013	0.046	2.428	32	0.009	0.00795
33	0.011	0.037	1.953	33	0.008	0.00708
34	0.010	0.030	1.584	34	0.007	0.006304
35	0.0085	0.025	1.32	35	0.005	0.005614
36	0.009	0.021	1.161	36	0.004	0.005

Again calling attention to the fact that the National wire gauge differs materially from the Brown & Sharpe American wire gauge or Stubs gauge, we are very truly yours,

IOWA BARB WIRE CO.

98 READE STREET, NEW YORK CITY.

The Equitable Natural Gas Company, of Pittsburgh, are rapidly finishing their new pipe line from the Northern Murraysville gas field to Pittsburgh. This will be one of the largest lines in the country. The entire distance will be laid with 24-inch and 30-inch cast-iron pipe. The corporation has now a capital of \$1,000,000. Mr. R. B. Brown, one of the originators of the old Fuel Gas Company, of Allegheny County, is the president, Reuben Miller, of Miller, Metcalf & Parkin, is treasurer, and W. H. Aldred is secretary. Mr. W. D. Hartuppee is the engineer of the company. The primary object of the company's organization is to supply all the manufacturers along the Allegheny River. They own from 2000 to 3000 acres of first-rate gas territory in the Northern Murraysville field. The main line to the city will be ready by July 15, and it will take 15,000 tons of cast-iron to manufacture all the pipe required.

## The Paris Copper Conferences.

Story of the Boston Herald.

LONDON, May 3, 1889.—The copper conference at Paris has utterly failed to accomplish the purpose for which it was designed. It has failed to arrive at any agreement, written or verbal, and it has broken up without fixing a price. The American committee have left Paris in disgust, and will sail from Liverpool for New York to-morrow (Saturday) on the steamship Servia, and to-morrow, by the time this message is read by the public, copper will be put on the open market and sold for what it will bring. The crash of the Comptoir d'Escompte and the Société des Métaux left certain eminent financiers with enormous amounts of copper in their possession, as collateral for money advanced to the so-called syndicate engaged in the recent ill-advised and unfortunate speculation. The copper so held amounts to 175,000 tons, of which about 25,000 tons are held in London and the rest in Paris. The Paris holders of copper are the Bank of France, 60,000 tons, and Rothschilds, 40,000 tons. These two holders have dropped 30,000,000 francs, exclusive of interest, in this speculation. The Banque de Paris et des Pays Bas holds 20,000 tons; Baron Hirsch, 20,000 tons, and the Credit Foncier holds a large amount. It is understood that Baring Bros. are the largest English holders. Then come the Union Bank of London, the National Discount Company and C. J. Hambro & Son, also of London.

The problem has been how to dispose of this copper and get back the money advanced, reimburse losses, and still keep up good prices. In view of the fact that American and English owned mines have large stocks ready for market, to glut the market by unloading these 175,000 tons without in some way curtailing the output of the mines for a longer or shorter period meant ruin to many and serious loss to all concerned, from employers in mines and metal industries up to the great financiers. In order to prevent such disaster and to foster a consumption by fixing a moderate price, the owners of American copper mines sent confidential representatives to Paris to confer with the holders of the immense stocks now in hand. The Calumet and Hecla Mine was represented by Col. Thomas L. Livermore, of Boston; the Anaconda Mine by its sole owner, J. B. Haggin, the hundred-times millionaire of San Francisco; the Tamarack Mine and the Boston and Montana Mine, Mr. Lewisohn, of New York, while Mr. Gordon Abbott and Mr. Wheelock, of the firm of Jere Abbott & Co., represented the smaller mines.

These gentlemen sailed from New York on the steamer Umbria and arrived in Paris the latter part of March. The Frenchmen showed little inclination at first to attend meetings. The Rothschilds and the Bank of France people, in particular, held aloof, evidently thinking it *infra dig.* to comply with the request of the American committee. After the 1st of April there were daily meetings in their parlor, or to speak by the card, three and four meetings a day, without a satisfactory conclusion being reached. At these meetings 16 gentlemen were present, first the American committee, consisting of Colonel Livermore, Messrs. Haggin, Lewisohn, Abbott and Wheelock, and then the Europeans, comprising M. Secrétan, representing the Société des Métaux; M. Edmond Moreau and M. Minichcourt, the official liquidators of the Comptoir d'Escompte; Baron Rothschild, Baron Hirsch, two directors of the Bank of France, one director of the Banque de Paris et des Pays Bas, Mr. Doetsch, of London, man-

ager Rio Tinto Mine; Mr. Mason, of London, of Mason & Barry Mine, and Mr. Guthrie, of Balfour, Guthrie & Co., the well known English metal brokers.

Day after day in the parlor these gentlemen met and discussed the situation. There was so much discussion the Americans grew weary. The Frenchmen talked and talked, talked and talked, as Frenchmen will. They were profoundly courteous; it is their habit. They agreed something ought to be done, but did not agree how to do it. They expressed great surprise at the collapse of the copper syndicate and the fall of the copper market, and couldn't understand why all their nicely-laid plans went wrong. Then they adjourned for *dejeuner*, to meet again and go over the same old ground of argument and surprise; then they adjourned for light refreshment. In the middle of the afternoon they returned to talk it all over again, and then adjourned for dinner, only to come back and repeat the previous performances. A fortnight went in this way, the Americans clearly not disposed to assist in forming another copper syndicate or to play into the hands of the European speculators. The Europeans were anxious to get rid of the copper on hand, but couldn't advantageously without the assistance of the American committee. There was a muddle all round. Whenever a way seemed clear something turned up to block it, and it began to look as though no arrangement could be reached, until one day Mr. Haggin, who had watched the proceedings in silence, came forward and addressed the meeting.

When Mr. Haggin says anything he says it to the point in the fewest words. He is a middle-aged, white-haired, white-bearded man of great dignity, cold manner, remarkably clear head, and he is unsurpassed in uncommunicativeness. When he spoke, his deep voice, solemn manner and imperious face awed the French. He said: "Gentlemen, I have listened to this discussion several days. If I have been edified I have not been instructed. You do not seem to appreciate the situation. It is this: I mine copper to sell, not to keep it to look at. It costs me nothing to mine my copper. The silver extracted from my ore yields such a profit that my copper is practically a by-product. But suppose I say copper costs me 3 cents per pound, ready for delivery in bars, you will see I can sell it at a profit whether you agree on a price or not. The Calumet and Hecla copper is better than my own, but it does not cost its owner over 2 cents a pound more. The Calumet and Hecla mine and my mine, the Anaconda, produce at the present time 60,000 tons of copper annually, but neither of them works full capacity. The Calumet and Hecla has 13 shafts and works only three. If that concern add the Anaconda work full capacity they can supply the world with nearly three-fourths its annual consumption of copper. We who compose this American committee have crossed the Atlantic to confer with you and assist in relieving your difficulties—for the difficulties are yours, not ours—but we are prepared to make concessions, and to expect you to do likewise. As I mine copper to sell, I shall return to America within a few days and sell it; meanwhile, if we can make an arrangement, well and good; if not, I shall put my copper on the open market and sell for what it will bring, and you must be prepared for the consequences."

The effect produced by Haggin's speech, which astonished and startled the Parisians, appeared to change the old views for new and they prepared to come to a speedy settlement. Then Colonel Livermore drew up a proposition which the Bank of France directors recommended for acceptance. The proposition was in brief this: That the selling price of copper be fixed at £45 per ton; that a com-



mittee be appointed to determine what proportion of the 175,000 tons now in hand shall be regularly placed on the market, and what proportion of the future product from American and English owned mines, the mines agreeing to curtail their output accordingly; this agreement to hold for six months, at the end of which time it could be renewed if it proved satisfactory, and if not satisfactory the parties concerned to meet again and make whatever arrangements necessary. This proposition was accepted and ordered to be engrossed for signatures. The Frenchmen desired that, when engrossed, the document be sent to the Barings in London to secure the English signatures, and then be returned to Paris for the French signatures. This desire was agreed to, and the meetings at the Hotel de l'Athenée dissolved, everybody supposing, at any rate the Americans, the matter settled. The Americans went to London to await the arrival of the engrossed agreement. It is well to add at this stage of the narration that the American committee considered the agreement fair to all concerned. It is within my knowledge that before the committee left New York certain capitalists, themselves large owners in the smaller mines, had expressed the wish that the Paris conference should fix the price at not less than £80 per ton, but the committee desired to open the New York copper market, and, while easing it, to make it steady. Everywhere in Europe the consumption of copper has seriously fallen off owing to the excessive prices forced by the late syndicate. In many places engineers are striving to find a substitute for copper. Naturally the American committee desired to take steps restoring public confidence and renewing the demand for copper, which could be done only by fixing an easy price and so regulating the new output and disposal of the present immense stock that the market should not be glutted, making a grievous fall in rates, which only a long period would set right again, and which might possibly precipitate a panic. The Frenchmen wanted as big a price as possible. Livermore proposed £40, but the Parisians would listen to nothing under £45, and even then an arrangement would mean four or five years before the present 175,000 tons can be worked off and past losses made up. They were disposed to no agreement until the Americans displayed the whip hand and declared themselves masters of the situation. Mr. Haggin told them in effect: Here is the proposition; take it up or drop it, as you choose. If you take it up, all right—you can realize on your holdings; if you drop it we shall leave Paris and shall not return, and you can make no arrangements with us. We can put copper on the market at terms impossible for you to deal with excepting at heavy loss. Mr. Haggin is an immovable man, with an experience of the world almost as vast as his wealth.

I have said that the American committee returned to London to await the arrival of the engrossed agreement. They waited days and they waited in vain. No document came. There was a hitch somewhere. No satisfactory explanations being obtained, Mr. Wheelock concluded that nothing could be done, and went to Sweden. Where was the mysterious hitch? It was suspected that Doetsch, of the Rio Tinto, knew more about it than anybody else. He was interviewed, and said he had changed his mind and intended to sue the directors of the bankrupt société and the comptoir, and meanwhile could not become a party to the agreement. Then the Frenchmen refused signing if Doetsch held off. In these circumstances the Americans could do nothing, and did not propose holding an umbrella over Rio Tinto while others stayed in out of the

rain. Doetsch's explanation was not satisfactory. The hitch was peculiar, to say the least. Meanwhile Rio Tinto shares went up and down on the stock exchange as though somebody found manipulating them profitable, but not with respect to the shareholders. The Americans interviewed Doetsch again. They found he had undergone another change of mind, and had decided on abandoning legal proceedings against the directors of the defunct société and the comptoir. He said he was ready to sign the agreement, but the agreement did not come. Colonel Livermore and Mr. Haggin decided to return to Paris. The last of April was approaching, and they told Doetsch they would sail for America on Wednesday, the 1st of May. Meanwhile they would go to Paris and put the matters through or leave them where they stood. Doetsch suddenly discovered he could not go to Paris before Thursday, the 2d of May. Colonel Livermore and Mr. Haggin decided they had had enough of trifling and delay, and started for Paris, and arrived there Friday evening, April 26. Wheelock still was in Sweden. Lewisohn, thinking it hopeless, remained in London. However, the Calumet and Hecla and Anaconda representatives were sufficient to put things through at this stage of the negotiations if things could be put through at all.

On Saturday morning Colonel Livermore and Mr. Haggin went to the Rothschilds' place in Rue Lafitte, meeting there the Barons Alphonse, Gustave and Edmond de Rothschild, all of whom appeared eager to arrange on the basis previously proposed, even going so far as to suggest putting the pressure, whatever that might mean, on Doetsch, and bringing him to Paris to sign. The two committeemen returned to the Hotel Athenée about noon. M. Moreau, liquidator of the comptoir, called upon them. He had no sooner departed than the three Rothschilds, with exact regard for etiquette, left their cards. Then Saturday passed, and Sunday and Monday, but no decision and no Doetsch. M. Goldschmidt, who is said to have \$500,000 in a Montana copper mine, but who has really sold out, as I am credibly informed, called and inquired: "Do you gentlemen intend returning to America before an arrangement is made?" The reply was: "No arrangement has yet been made, and all the American committee will sail on the Servia Saturday, May 4." It had been found advisable to sail Saturday instead of Wednesday. Imperturbable Mr. Haggin calmly declared: "I shall leave Paris for London on the 11.15 train to-morrow morning." He was as good as his word. Tuesday morning he went to London, leaving Colonel Livermore in charge of affairs. The Colonel arranged for a meeting Wednesday, declaring absolutely that he should leave Paris after that agreement. As no agreement was made in the latter case nothing could induce the American committee to return to Paris or delay the date of sailing for New York. European copper holders having made their bed must lie in it. On Wednesday refractory Doetsch appeared in Paris. Whether or no the Rothschilds had put a pressure upon him is matter for surmise; at any rate, no amount of pressure induced him to agree with what appeared to be the opinions of the other gentlemen. He insisted, for one thing, that the American mines should send only 20 per cent. of their surplus copper to Europe. It was manifestly impossible for Colonel Livermore to agree to this, and after further unprofitable discussion adjournment was made till Thursday. On Thursday Doetsch was as strangely obstinate as ever, and Colonel Livermore declared further discussion useless, and left the meeting and arranged to leave Paris the following morning (to-day) by the 9.40 train for London. This morning while he

was dressing the Frenchmen called and asked him to meet them, and a final conference was held about an hour before the departure of the train, but to no purpose. Colonel Livermore reached London this evening, and, with the other members of the American committee, left for Liverpool to-night by the midnight train, and will embark on the Servia in the morning. The committee did all they could to effect an amicable settlement. Doetsch was the stumbling block. The other Europeans profess to be angry with Doetsch. Perhaps they are. At any rate, something will crash before long.

## OBITUARY.

WILLIAM H. BARNUM.

The *Bulletin* of the American Iron and Steel Association prints the following sketch of the life of William H. Barnum, who died at his residence at Lime Rock, Conn., on Tuesday morning, April 30, 1889. Mr. Barnum had been confined to his bed only two or three days, but for the preceding 48 hours his death had been expected momentarily.

William H. Barnum was born in Boston Corners, N. Y., on September 17, 1818. He received a public school education of a substantial kind. His father, originally a farmer, established the first iron foundry at Lime Rock, Conn., and all his life William H. Barnum was extensively engaged there and in the neighborhood in the manufacture of pig-iron and car-wheels. Many years ago he became interested in iron ore mines in the Lake Superior region. He was successful as a business man, and accumulated a fortune. He figured prominently in Connecticut politics for many years. In 1851 and 1852 he was a member of the State Legislature, and since 1868 he had been a delegate to every Democratic National Convention. Since 1872 he had been a member of the Democratic National Executive Committee, and for some years was its chairman. He was elected to the Fortieth Congress in 1865, when he ran against his cousin, P. T. Barnum (Rep.), the showman, and was re-elected to the Forty-first, Forty-second, Forty-third and Forty-fourth Congresses. He served from March, 1867, until May, 1876, when he resigned to take a seat in the United States Senate, having been elected to fill the vacancy caused by the death of Orris S. Ferry (Rep.). His term expired in March, 1879, when he was succeeded by Orville H. Platt (Rep.). He has been, however, most prominent as chairman of the Democratic National Committee, a position which he held continuously from 1877 until his death.

In the foregoing condensed account of the leading events in the life of Mr. Barnum his prominence as an iron manufacturer has been briefly referred to. He was one of the most enterprising and successful iron manufacturers the country has ever known. Early in his life he engaged in the manufacture of charcoal pig-iron in the celebrated Salisbury district of Connecticut. At the time of his death he was either sole or part owner of seven charcoal furnaces in Litchfield County, Conn.; three charcoal furnaces in Berkshire County, Mass., and one charcoal furnace in Dutchess County, N. Y.—in all 11 furnaces, all operated with charcoal and all using Salisbury ore or ore of the same characteristics. The pig-iron produced from Salisbury ore is admirably adapted to the manufacture of car-wheels, and it was this quality which led Mr. Barnum to combine the business of manufacturing pig-iron with that of manufacturing car-wheels. His operations, however, were not confined to the localities above mentioned. He was at one

time engaged in the manufacture of car-wheels in Chicago, and he was also a large owner of the Barnum iron-ore mine in the Lake Superior region.

#### FREDERICK LUNKENHEIMER.

The business community lost an able man in the death of Mr. Frederick Lunkenheimer, the late president and general manager of the Lunkenheimer Brass Mfg. Company, of Cincinnati, Ohio. He was born in the province of Rhine-Hessen, Germany, October 24, 1825. In Mayence, at the age of 14, he served as an apprentice in a mechanic's establishment for three years, and the subsequent three years as a journeyman. He arrived in New York in 1845. He there found employment in the establishment of the Morse Telegraph Company, where he was put to work upon the first telegraph instrument made in this country. After spending five years in New York and becoming conversant with the English language he went to St. Louis, Mo. The next important event of his life was his trip to New Orleans, La. At this time the yellow fever was raging, and he was one of the many who were taken seriously ill and given up to die, but fortunately he recovered, and then started for New York by way of the Mississippi and Ohio rivers. On his way he was robbed of all his funds, which was the cause of his remaining in Cincinnati. In October, 1862, he began a business of his own, of course small at first, his entire force of workmen consisting of himself and one apprentice. It gradually expanded until the present concern gives employment to 150 men.

The business of the company will be continued as heretofore under the management of his sons, in behalf of the stockholders of the company, who are the members of the family of the deceased.

#### Obituary Notes.

Samuel Orchard, manager of the Newton Copper Type Company, of No. 14 Frankfort street, died on the 2d inst. He was a native of England, having been born in Bridgewater on January 1, 1816. He came to this country when 18 years old, and engaged in the drug business in New York. In 1851 he founded, with Dr. Newton, the Newton Copper Type Company, becoming its manager and secretary, and retaining his connection with it until his death.

On the night of the 8d inst. Hugh McDonald, well known in Pittsburgh as patentee of the furnace shield bearing his name, and which is used quite extensively in the mills throughout the country, was found dead in bed in one of the hotels of that city.

John Kennedy, a prominent stockholder of the Illinois Iron and Bolt Company, died at Chicago on the 25th ult. He was born in Pittsburgh in 1825 and settled in Chicago in 1850. He began the manufacture of elevators and hoisting machinery in 1853, continuing in that business until 1888, when he began to take an active interest in the affairs of the Illinois Iron and Bolt Company, of which he had been one of the original stockholders and for many years a member of the board of directors.

Frederick A. P. Barnard, after more than 25 years' service as president of Columbia College and more than half a century's work as instructor in various institutions, is dead at the age of fourscore years. President Barnard was born in Sheffield, Mass., in 1809, and his life was spent in educational work. He graduated from Yale with high honors when 17 years of age, and began his teaching a year later as tutor in the college. Besides his work as instructor, President Barnard

was a well-known writer on scientific subjects and the author of several works of decided practical utility.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., May 7, 1889.

The Chief Constructor of the Navy has a large corps of experts engaged in preparing the plans for the additional vessels of war authorized by Congress. This will embrace cruisers Nos. 9, 10 and 11, each of 2000 tons displacement. The advertisements for the vessels will be made public during the present week. It is hoped that the contracts may be awarded so that the work may be commenced before fall.

The greatest disappointment is expressed in naval circles that the appropriation by Congress for the coast-defense vessel was not sufficient to include the submarine torpedo-boat which was authorized under the same appropriation. The award of the coast-defense vessel was made to the Union Iron Works, of San Francisco, although the bid was higher than that of the Cramps, on account of the acceptance of the specifications of the Department in regard to boilers without question. The figures of the contracts for the vessels were as follows:

Chas. Cramp & Sons, Philadelphia, \$1,614,000, with exceptions.  
Union Iron Works, San Francisco, \$1,628,000, without exceptions.  
Quintard Works, New York, \$1,690,000, without exceptions.

The Cramps were not disposed to make any modifications and give a guarantee of that which they were doubtful of their ability to perform. The Pacific-Coast people made no exceptions. It now remains to be seen whether they will be able to give the results which the Cramps claim cannot be obtained as required by the Department. There has been considerable controversy in engineering circles as to the machinery of the Charleston and the Vesuvius. The former vessel guarantees 7000 horse-power, with weight of machinery limited to 620 tons. The machinery of the Vesuvius, including engines and boilers, weighs 246 tons and has developed 4450 horse-power. There appears great rivalry between the East and West on the subject of naval machinery, the result of which it is thought will prove beneficial in the way of improvements. The working plans of the coast-defense vessel which have been prepared by the Bureau of Construction are the most complete which have been prepared for the construction of a vessel by any government. The sheets number over 80, and give a view of every position and detail of the monster engine of war.

It is stated on good authority that William Weihe, for the past six years president of the Amalgamated Association of Iron and Steel Workers, of Pittsburgh, has decided not to be a candidate for reelection at the coming annual convention of the organization, and will retire to engage in business pursuits. Efforts have been made by members of the association to induce James H. Nutt, of Youngstown, to allow his name to be used as a candidate in the event of President Weihe retiring, but he has declined by reason of having been tendered a lucrative appointment in the employ of the Government. As the salary of the president of the Amalgamated Association is \$1500 per year and traveling expenses, it is probable that each district will have one or more candidates.

It is reported that a fire is raging in the Aurora Mine, on the Gogebic range. It is one of the large producers of the district.

## PERSONAL.

W. H. Borntraeger, manager of the Seventy-ninth street mills of Carnegie, Phipps & Co., Limited, at Pittsburgh, sailed for Europe on the 4th inst., accompanied by his wife and family, for an extended pleasure trip.

Mr. J. A. Nichols, the well-known president of the Pittsburgh Bridge Company, of Pittsburgh, was presented by his employees with a handsome reclining chair on Saturday, the 27th ult. In a speech thanking the men for their kindness, Mr. Nichols related how he had entered the employ of the firm at \$1.50 per day until he had risen to be president of the company.

At the annual meeting of the Chester Rolling Mills, Thurlow, Pa., the following officers were elected: S. A. Crozer, president; S. A. Crozer, Jr., vice-president and treasurer; Richard Peters, Jr., secretary, and C. B. Houston, general manager.

T. J. Houston, the former general manager of the Chester Rolling Mills, Thurlow, Pa., has accepted a similar post with the Crozer Steel and Iron Company, Roanoke, Va.

R. H. Lewis, president of the Chicago Furnace Company and vice president and general manager of the Calumet Iron and Steel Company, of Chicago, resigned both of those positions on the 1st inst. He continues to hold the vice-presidency of both the Chicago Drop Forge and Foundry Company and the Milwaukee Furnace Company and the presidency of the National Coke and Fuel Company. He is also a member of the executive committee of the National Storage Company, of Chicago, of which he was one of the originators. Mr. Lewis has managed the business of the Calumet Iron and Steel Company since January, 1886, to the entire satisfaction of the owners, who regret the severance of the relationship. He had previously been connected with the Lake Erie Iron Company, of Cleveland, Park, Bro. & Co., of Pittsburgh, and other iron and steel establishments. In view of his executive ability and his thorough knowledge of the iron and steel business he has received flattering offers from several sources since his retirement from the Calumet Iron and Steel Company has been made public, but he proposes to devote some time to the settlement of his private affairs before seriously considering their respective merits.

President Woodward, of the Hanover National Bank, with C. C. Baldwin and Col. Daniel S. Lamont, are to make up a Southern party. They go to Birmingham, Ala.

A party of Chicago and Boston capitalists will accompany O. W. Potter, of the Illinois Steel Company, Chicago, to visit the tin mines of the Black Hills, Dakota.

Wm. L. Abbott, of Carnegie, Phipps & Co., Pittsburgh, has been elected an associate member of the American Society of Civil Engineers.

Among the Americans proposed for membership in the Iron and Steel Institute, now in session in London, are Harmer Adler, of Chicago, G. T. Barns, of Philadelphia, F. Lynwood Garrison, of Philadelphia, Gustavus Henning, of Stamford, Conn., Andrew S. McCreath, of Harrisburg, and Stuart Wood, of Philadelphia.

Harry W. Oliver, of the firm of Oliver Bros. & Phillips, of Pittsburgh, has been elected president of the Pittsburgh and Western Railroad, to succeed James Callery, recently deceased.

# TRADE REPORT.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., May 7, 1889.

**Pig-Iron.**—The market is somewhat unsettled, and on the whole prices have not been fully maintained. This is largely due to the anticipated action of the Thomas Iron Company, which materialized on Monday in the announcement of \$15, \$15.50 and \$16.50 as their quotations for the three grades of Iron, delivered at tide. Of course the general market is not \$1.50 per ton lower because of the Thomas company's reduction, as this action had been anticipated for some time past, and prices shaded accordingly. Sales have been recently made at from \$14.65 to \$14.75 for Gray Forge delivered in consumers' yards; \$16 for No. 2, and about \$17.50 for No. 1. Per contra, a few choice brands have been marketed somewhat freely at \$15 for Forge, \$16.50 @ \$17 for No. 2 and \$18 @ \$19.50 for No. 1, which are, of course, extreme figures, as also were those first mentioned. It is hard to say what may be the ruling figures two or three weeks later on, but the impression is that the Thomas Iron Company's action has been fully discounted, and that in the absence of further unfavorable developments the prices quoted by that company will be the minimum for all good Irons. Quite a number of furnaces are blowing out, or preparing to do so, on account of the unprofitable condition of business, so that if the demand continues as large as seems probable a reaction in prices would not at all surprise the trade. Of course there is the midsummer shrinkage in consumption to be taken into account, and a good deal will depend upon what length of time the mills take for repairs, holidays, &c. There are several other contingencies to be considered also, and until these can be estimated with a fair degree of exactness it is hardly likely that any special movement will be started in Pig-Iron. It is taken for granted, however, that the lowest figures of the entire year will be those dating from the middle of April to July, or probably August, and that after that date the market will be on the up-grade. The great difficulty is to define the exact position of the market today, because a price which one may accept is quite likely to be an entirely different figure from that which another would require. There are differences in quality, differences in judgment as to quality, differences in deliveries, differences in the financial standing of buyers, as well as differences in the financial position of sellers, and these are important considerations in times like these in determining what price should be accepted, or paid, for a particular class of Iron. The range, however, seems to be from \$14.75 to \$15.25, delivered, for Gray Forge; \$16 @ \$17 for No. 2 Foundry; and \$17 @ \$18.50 for No. 1, with a gradual recession from the higher figure to those of a medium or inside character. What the eventual course of the market is to be is still a matter of conjecture, although, as we have already stated, present prices are believed to be bottom prices, and not likely to be continued for any great length of time.

**Blooms.**—There is a tolerably fair movement in Steel Blooms, but some irregularity in prices is noted; and occasionally concessions have been allowed, so as to secure desirable orders. General quotations, however, are about as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$29 @ \$30 for Sheet-Iron Billets; \$30 @ \$31 for Soft Tank, and \$35 @ \$36 for Flange purposes; Charcoal Blooms, \$52 @

\$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck-Bars.**—Prices are again firmer, and while \$27, delivered, is about as high as was realized during the past week, many holders now ask a shade over \$27, and in most cases would probably refuse less than that. The feeling is feverish and unsettled, in anticipation of higher prices in the near future.

**Bar-Iron.**—The feeling is a shade steadier, but the demand is not by any means what could be desired or expected under existing conditions. There is a disposition to ask more money—say about half a tenth—on the general run of orders, while for deliveries after next month a full tenth advance would be required, although as yet buyers have not shown any desire to contract for large lots. Still, it is believed that prices have seen their lowest for the current year, and that whatever changes may occur will be in the direction of improvement. The asking rates are from 1.75¢ to 1.85¢ for best refined Bars, although, of course, cutting in extras or other concessions is still largely indulged in. There is some talk of a renewed demand for Skelp Iron. Western mills are all full of orders, and directly or indirectly it is probable that Eastern mills will begin to feel its effects before long.

**Plate and Tank Material.**—There is a fair demand for Plates, and all the mills are tolerably well filled up with work for the next 30 or 40 days. There is nothing specially new on the market, but of late every week seems to bring enough work to offset the week's deliveries. Manufacturers are feeling their way carefully for a slight advance in prices, and while very little has been realized as yet, the position of the market is indicated by the fact that sellers are figuring in that direction. Meanwhile nominal quotations are about as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.8¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 3½¢.

**Structural Material.**—Nothing large has been taken during the past week, but mills are very well supplied with work for the present, so that the feeling is somewhat cheerful, as there is a great deal of business to come on the market before long. When the mills are running full (as at present) they can afford to wait developments, as there is no doubt that large accessions will be made to their order-books during the summer months. Prices have not changed recently and the usual asking rates are nominally as follows: Bridge Plate, 1.95¢ @ 2.05¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet Iron.**—The demand has been rather heavy, and mills have accumulated quite a liberal supply of orders during the past couple of weeks. Some have nearly three months' work on hand, and as these are also filling up prices are held with considerable firmness, although in the meanwhile quotations continue as before, viz.:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, ½¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3¼¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3¾¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, ½¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67½ %

**Steel Rails.**—The market is very much unsettled by reports of further cuts made by the Pittsburgh manufacturers. In this vicinity sellers are not inclined to change their position, and still quote from \$27.50 to \$28, f.o.b. cars at mill, although of course they are not entering much business at those prices. The disposition is to wait for further news from the storm center.

**Old Rails.**—No business whatever in this vicinity, so that prices are entirely nominal at about \$22 bid to \$23 asked.

**Old Car-Wheels.**—The Baltimore and Ohio Company report having sold 2000 tons at \$19, although that figure is very much beyond buyers' ideas in this market.

**Scrap-Iron.**—More inquiry, but prices are unsettled, although nominally unchanged, as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish Plates, \$28 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—There is a good demand for Pipe, and prices are well maintained. Discounts are about as follows: Butt-Welded Black, 55 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 55 %; Boiler Tubes, 62½ %.

**Nails.**—There is a considerable demand for Nails, but no general improvement in prices. Quotations remain at \$1.90 @ \$2 for store lots, and \$1.80 @ \$1.85 for carload lots, but prices are irregular, and in some cases very low figures have been accepted for large lots.

E. D. Smith & Co. have removed their office to 208 South Fourth street, where they have much greater facilities for conducting their increasing business than at their former place.

Wm. R. Hart & Co. have been appointed general agents for the Spiral Weld Tube Company. E. Coit, formerly president of the Reading Iron Works, has recently become associated with Wm. R. Hart & Co., and will give special attention to that portion of the firm's business.

L. & R. Wister & Co., of Philadelphia, have taken the agency for the Tuscawas Pig-Iron made at Canal Dover, Ohio, by the Penn Iron and Coal Company. It is what is known as the American Scotch, being made of a large mixture of Black-band Ore. They have taken the agency for the territory embracing New Jersey, Pennsylvania, Delaware and Maryland.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street,  
CHICAGO, May 6, 1889.

The increased earnings reported by railroad companies are eagerly seized as evidences of returning prosperity, but thus far no signs are apparent of a disposition among them to purchase supplies more liberally. Cautious business men are not disposed to bank very heavily on the reports of an improvement in the railroad situation, fearing that it is too late in the year to expect much relief in that quarter. Yet a better feeling is perceptible in some branches of trade, and the prospects of an early improvement in the demand are brightening. Consumers of Bar-Iron and Steel are urging quick deliveries on their small purchases, clearly showing that they have very light stocks, and inquiries are more abundant. Orders for fall delivery would be placed rather freely if the mills were disposed to take them at present prices. On immediate business the situation is unchanged, the demand being light and prices wretchedly low.

**Pig-Iron.**—While more local Coke Iron is being sold than any other kind, the volume of business is very small, consisting almost entirely of carload orders. Quotations are nominally unchanged, but a very weak feeling pervades the market, and it is believed that prices are off an average of 25¢ per ton as compared with the previous week. Small quantities of Lake Superior Charcoal have been sold at old rates, but large buyers are still holding off, although they are doing a great deal of talking to discover the true position of the manufacturers with regard to season contracts, the time for placing them drawing near rapidly. Cash quotations are as follows, f.o.b. Chicago: Local Coke Iron, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, \$16.50; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16; No. 2 Foundry and No. 1 Soft, \$15.50; No. 3 Foundry, \$15; Gray Forge and No. 2 Soft, \$14.25; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

**Bar-Iron.**—Sales have been quite light during the past week, but inquiries are more numerous. Hopes of an early improvement in this branch of trade have been aroused by the efforts of some heavy buyers to place orders for late summer and fall delivery. Manufacturers, however, are endeavoring to establish a higher price on business of this character, and thus far have been unable to make buyers meet their views. Stocks are very light in consumers' hands, as they insist on very prompt deliveries of the small orders which they are placing. Mill lots of Common Iron are quoted at 1.60¢ @ 1.65¢, half extras, f.o.b. Chicago, the valley mills pretty generally naming 1.50¢ at mill. Small lots from store are selling at 1.75¢ @ 2¢, according to quantity and quality, with buyers disposed to discriminate in favor of best grades.

**Structural Iron.**—The demand is still of a retail character. Carload lots from mill are quoted as follows, f.o.b. Chicago: Universal Plates, 2.15¢ @ 2.20¢; Angles, 2.10¢ @ 2.15¢; Tees, 2.50¢ @ 2.55¢; Beams and Channels, 2.90¢. Angles from store are held at 2.25¢ @ 2.30¢; Tees, 2.65¢ @ 2.70¢; Beams, 3.4¢.

**Plates, Tubes, &c.**—The boiler-makers are still suffering from a dearth of work, making the city demand for Plates exceedingly light, but the country trade is fair. Prices are firm, a slight advance having been made on Heavy Sheets from mill, but quotations from store are unchanged, as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 65 % off for 3-inch and over, 62½ % off for 2 to 2½ inch, and 57½ % off for 1½-inch and smaller.

**Sheet Iron.**—Orders for Black Sheets for fall delivery are still in the market and mill prices are firmer, the manufacturers most eager for contracts having well covered their capacity. Prices may now be quoted at \$2.80 @ \$2.85 at mill for No. 27 of fair quality; guaranteed to corrugate commands 15¢ per 100, or \$3 per ton, more. Store lots of No. 27 Common are available at \$3.10 @ \$3.30, according to quality.

**Galvanized Iron.**—Manufacturers' agents have had a moderate trade from warehouse, but heavy orders were rare. Prices are still very low, small lots of Juniata being quoted at 65 % off and Charcoal 65 and 2½ % off, with concessions to best buyers.

**Merchant Steel.**—A few good-sized orders for Spring and Agricultural Steels were placed during the week, and there was a fair demand for small lots. Quotations are unchanged, as follows: Soft Steel Bars, 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢; Sheet Steel, 7¢, 8¢ and 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Steel Rails.**—Small orders are being received in encouraging quantity and inquiries are numerous, but no heavy transactions have recently occurred in this market. The Joliet works started up on Soft Steel Billets and Wire Rods on the 1st inst., and will be turned on Rails at an early day. Standard Rails are quoted at \$29.50 @ \$30.

**Track Supplies.**—The demand is still quite limited, with quotations as follows: Steel Fish-Plates, 1.80¢ @ 1.90¢; Iron Fish-Plates, 1.70¢ @ 1.75¢; Bolts with Square Nuts, 2.55¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.95¢ @ 2¢.

**Old Rails and Wheels.**—On the basis of sales recently made at Milwaukee Old Iron Rails are worth about \$19 @ \$19.50 here. Prices have for some time been too high for business with the Mahoning Valley, the mills of that section having been able to supply their requirements at lower figures in other directions. Old Steel Rails are quoted at \$14 for short lengths and \$18.50 for selected. Small sales of Old Car-Wheels have been made at \$17, and stocks continue to accumulate.

**Scrap.**—An abundance of Old Material is being offered by railroads and machine shops, but consumers are not taking hold. Small sales are occasionally made to them, but the bulk of transactions is with dealers who are stocking up heavily at low cost. They quote as follows to consumers per ton of 2000 lb: No. 1 Wrought, \$17.50 @ \$18; Track, \$18; Axles, \$23; Horse-shoes, \$18; No. 1 Mill, \$13; Cast Machinery, \$12; Stove Plates, \$9; Cast Borings, \$8; Wrought Turnings, \$11; Axle Turnings, \$12.75; Mixed Steel, \$10.50 @ \$11; Coil Steel, \$13.50; Leaf Steel, \$15.

**General Hardware.**—The situation has again changed with respect to Shelf Hardware, and business is now very active. The month of May opened with a rush which had hardly been anticipated, although it was earnestly desired. Heavy Hardware is quiet, mainly on account of the limited demand for Iron and Steel, a fair trade progressing in Wagon Stock.

**Nails.**—Manufacturers' agents report a moderate inquiry for Steel Cut Nails from country merchants, who are submitting specifications for deliveries in the next 80 to 60 days. Stocks are light in their hands, but they are buying cautiously for fear of prices going lower. The indications are strongly in favor of greatly increased business in this line before the close of the month. Jobbers are doing very well. They quote small lots of Steel Nails at \$1.95 @ \$2 and Wire Nails at \$2.35 @ \$2.40, with the usual reduction for mixed carloads.

**Barb Wire.**—The situation is unchanged. With a very active demand, both on manufacturers and jobbers, small lots of Painted are sold at 2.75¢ @ 2.80¢ and Galvanized at 3.35¢ @ 3.40¢.

**Tin-Plates.**—Prices are a little higher on account of a growing scarcity. An advance of 25¢ per box has been made on regular sizes of Bright Plates and of 50¢ on Roofing-Plates.

**Pig-Lead.**—This market has been quite active for the past two weeks, owing to the demand for spot Metal to bridge over arrivals of contract Lead. The total sales in the time mentioned covered some 1200 tons, mainly at 3.47½¢, with some lots at higher figures. At present 3.50¢ is asked.

Russell & Roberts, manufacturers of castings at Paulina street and Blue Island avenue, Chicago, dissolved partnership on the 1st inst. The business will be continued by Francis E. Roberts.

F. W. Barker & Co., manufacturers of Architectural Iron-Work, have removed their city office to room 1050 in the Rookery Building, Chicago.

A. Schroder, broker in Iron, Steel, Old Rails, &c., has removed his office to room 825 in the Insurance Exchange Building, 218 La Salle street, Chicago.

Charles Himrod & Co., Room 518, Rookery Building, Chicago, have been appointed sales agents for the entire product of Merchant-Bar Iron and Nails manufactured by the Calumet Iron and Steel Company. F. G. Holton, who has for many years served the company as general agent, will continue to act in that capacity. Messrs. Himrod & Co. are well known in Western trade circles as dealers in Pig-Iron, Coal and Coke, and the reputation which they have established in those lines is an indication of their success in making this new departure. All correspondence in relation to purchases of the products of the Calumet Iron and Steel Company is to be directed to them.

John McLauchlan, Western manager for the Andrews Bros. Company, of Haselton, Ohio, manufacturers of Pig, Bar and Sheet Iron and miners of Coal, has removed his office to Rooms 301 and 302 at 59 Dearborn street, Chicago.

Jones & Laughlins, Limited, have been appointed exclusive Chicago agents for the sale of the Railroad Spikes manufactured by Dilworth, Porter & Co., of Pittsburgh. They will keep on hand at all times a large stock of these Spikes in their warehouse at Lake and Canal streets.

D. Forsythe Morris, Western manager for Milliken & Co., of New York, and the Phoenix Iron Company, of Philadelphia, has removed his office to Rooms 407 and 408 at 59 Dearborn street, Chicago. The Phoenix Iron Company are now manufacturing all sizes of Open-Hearth Steel Beams and making prompt shipments.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, May 6, 1889.

**Manufactured Iron.**—The mills and foundries in this section are doing very little and have few orders ahead, but the agricultural works are stimulated by the good agricultural outlook, and Pipe-works continue to melt heavily. Prices of Bar and Structural Iron are unchanged, but an easy tone prevails.

**Pig-Iron.**—The local Pig-Iron market during the past week has been again dull and weak, with more pressure to sell Southern production, for some grades of which lower prices have been accepted. The large buyers who have been trying the market have retired temporarily, and even the aggregate of small orders has been less. The only transaction beyond the limit of carload or 100-ton business which has been made known since our last review is that of 500 tons Mottled Iron at \$12, cash, and one lot of the same grade reported at \$11.75, spot. Small amounts of No. 1 Southern Foundry have been sold at \$14.75, and No. 3 do. at \$13.25. Gray Forge has been easy at \$13 and prices of Bessemer and Northern Iron have been reduced, the former materially. The movement of Car-Wheel Iron has improved a little, but individual sales have been small. A short supply of Ohio Silvery Iron is predicted for the near future, another furnace making this grade having been suspended during the week. The failure of the Aetna Iron Works, at Ironton, making



Hanging Rock Cold-Blast Iron, had been discounted to a great extent during the past few months, and the effect upon the market at present is unimportant. The following are the approximate prices current here at the close, for cash, f.o.b.:

**Foundry.**

Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.00 @ 14.50
Southern Coke, No. 3 (new classification).....	13.25 @ 13.75
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	17.00 @ 18.00

**Forge.**

Strong Neutral Coke.....	13.25 @ 13.50
Mottled Neutral Coke.....	11.75 @ 12.00
Gray Forge.....	12.75 @ 13.00

**Car-Wheel and Malleable Irons.**

Southern Car-Wheel.....	20.00 @ 25.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.50 @ 21.50

**Nails.**—The demand has been moderate, and at free offerings it has been readily met at previous prices. 12d @ 40d sell at \$1.90 @ \$1.95  $\frac{p}{b}$  keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.45 @ \$2.50  $\frac{p}{b}$  keg.

**Old Material.**—The market has been without improvement. Old Rails have been obtainable at \$20, cash, with buyers at \$19.50, spot. Old Wheels have been neglected, but there has been no pressure to sell, and prices have remained nominal at \$17 50 @ \$18  $\frac{p}{b}$  ton, cash.

**St. Louis.**

OFFICE OF *The Iron Age*, 212 N. Sixth st.,  
ST. LOUIS, May 6, 1889.

**Pig-Iron.**—The general tone of quietness which has characterized this department for some time continues, although the dullness is not quite so decided as it has been, and occasional sales are made that are indicative of some show of strength, even if in a small manner. The local trade is well employed, and if the activity continues for any length of time they will soon be in the market to replenish their stocks, as it is understood that few of the manufacturers have any great amount of stock on hand, and as the furnace banks are pretty well depleted, any decided movement made in the direction of larger buying is likely to result in some improvement in prices, and with this end in view furnaces are not disposed to make any great effort to push the sale of their product, as only small quantities are taken, and generally at prices that leave but little margin in the way of profit. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry.....	\$15.50 @ \$16.00
Southern Coke, No. 2 Foundry.....	15.00 @ 15.25
Southern Coke, No. 3 Foundry.....	14.50 @ 14.75
Gray Forge.....	13.50 @ 14.00
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	20.50 @ 21.50

**Missouri.**

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

**Tennessee.**

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.

**Bar-Iron.**—There is considerable improvement to note in this connection, and mills are well filled with work. Prices show more strength, and the extreme quotations of some weeks since have been withdrawn from the market. For small

lots from store we quote \$1.80 and carload lots from \$1.60 to \$1.70, according to circumstances.

**Barb Wire.**—The improvement last noted continues, and mills are kept busily employed to make deliveries. The spring trade has been very large, and from present indications the demand is likely to keep up well into the summer months. Prices are firm and show a tendency to advance, and the low prices which have caused such demoralization in the trade during the first three months of the year have been withdrawn, and it is evident the mills that made the quotations have become tired of selling at figures that were certainly very close to cost. Mills quote from \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized. Carload lots are quoted at from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

**Detroit.**

WILLIAM F. JARVIS & Co., under date of May 6, 1889, report as follows: Business for the past week has been dull, and although a few good-sized orders for Lake Superior Charcoal have been booked, yet the general market does not show any improvement. Shipments are being made on old orders, and consumers generally are using as much Iron as usual and stocks in yards are light. Notwithstanding all these facts, buyers put off placing orders, except for immediate wants, until they can see signs of an immediate advance. If the turn comes without any warning, as it usually does, some of them may have to pay more and also be unable to secure special brands they are using. With a quiet market we quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.50 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.50 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.50 @ 17.00
Jackson County (Ohio) Silvery.....	18.25 @ 18.75
Old Wheels.....	18.50 @ 19.00

**Chattanooga.**

Office of *The Iron Age*, Carter and 9th Sts.,  
CHATTANOOGA, May 6, 1889.

**Pig-Iron.**—There is no change of interest to note. There appears to be a demand for the output of all the furnaces, as there is very little accumulating at the yards, and there has been but little if any change in prices to consumers. Occasionally when a furnace accumulates a good, round lot and the prospect of orders for consumption is not very bright some one is found with money, to whom the whole lot is closed out at prices which, of course, are not made public. There is considerable Iron now being placed in this way through the South. It will no doubt be kept out of the market so long as prices remain as they are. In reference to the future, nearly every one has "no opinions to express." All predictions in the past appear to have come to naught, and very few can now be found who have views on the subject. In the meantime there seems to be no diminution of output, and there are no intimations from any of the furnaces that they intend to blow out. On the other hand, there are several companies being formed to erect new stacks. These are, however, being done in connection with newly-laid-out towns, of which some will no doubt mature, as they are backed by parties who have already invested large sums, and having still greater means at hand can and will expend a great deal more in order to make available what they have already put in. At the present time mineral lands are commanding enormous prices, or at least considered so by the

old heads that for many years looked upon the ore lands as comparatively worthless, and what could have been bought a few years ago for \$500 to \$1000 are now selling for sums ranging from \$200,000 to \$500,000, and many transactions involving up into the hundreds of thousands are now taking place.

**Miscellaneous.**—A little episode took place a few days ago at the Lookout Rolling Mills, of this city, which may be of some interest to Southern Iron-masters. There arose a difference between the white employees and the management, which appeared to be irreconcilable, and they virtually agreed to disagree and were paid off. There appears to have been no particular friction nor interchange of harsh expressions, no threats or manifestations of trouble. In about four days the works started up again with negro labor exclusively, both skilled and common, and to-day are running as smoothly as ever. This makes three mills now running in the districts with negro labor exclusively, and there are also now three foundries which are running exclusively with negro molders and laborers. Among these men there exist no unions, no societies that have any semblance of combination, and as a general thing the men are sober and industrious and anxious to give satisfaction to their employers. Is it not significant of the future?

**Cleveland.**

CLEVELAND, May 6, 1889.

**Iron Ore.**—Business in the Ore market during the past week has been of a character quite satisfactory to the dealers. It is probably true that there have been sales of certain grades of Ore at prices from 15¢ to 25¢ less  $\frac{p}{b}$  ton than were asked for the same Ores at the beginning of the season, but there has been no general revision of quotations, and a few of the especially rich Ores maintain all the firmness prophesied for them at the beginning of the season. This is especially true of the output of one mine, which has commanded \$6.25  $\frac{p}{b}$  ton steadily, and is still in good demand at that figure, the Ore analyzing less than 0.02 % of phosphorus. Many of the transactions reported during the week have involved more than moderate blocks, and while it is true that some of the orders are indorsed upon the books "subject to market prices," it is equally certain that more of the sales have been entirely legitimate. Any differences of opinion that may exist between the Carnegie interests and certain mine owners do not affect the sales to Eastern furnacemen or to the heavy consumers in Chicago, these purchasers having already bought 1,250,000 tons of Ore at about the prices given in these reports since the opening of the season. At the headquarters of all the numerous mining companies in this city the market is pronounced active. It is doubtful, however, if over 20 % of the 2,500,000 or 3,000,000 tons of Ore likely to be consumed in the Mahoning and Shenango valleys and in Pittsburgh has been sold. The prevailing reports of the dispute over prices between the Ore men and many of the Pittsburgh and Mahoning Valley furnaces are considerably overstated, but a few of the heavy consumers believe that with the concessions obtained from the vesselmen and in view also of the drowsy condition of the Pig-Iron market slightly better figures should be expected from the Ore men. Some of them are accordingly confining their purchases to non-Bessemer Ores, over the prices of which there is less opportunity for controversy, and which are now offered at quotations slightly below those prevailing during April. Bessemer Ores from the Gogebic and Menominee ranges may also be bought at more favorable terms. Non-

Bessemer 62 % Ore has been offered at \$3.85 on cars at Buffalo and has been refused. The following are the quotations at present:

Specular and Magnetic Bessemer Ores	\$5.75 @ \$6.25
Specular and Magnetic Non-Bessemer Ores	4.50 @ 5.00
Red Hematite Bessemer Ores	3.50 @ 4.00
Red Hematite Non-Bessemer Ores	3.50 @ 4.00
Menominee Range Bessemer Ores	4.90 @ 5.10
Menominee Range Non-Bessemer Ores	3.50 @ 4.00
Gogebic Range Bessemer Ores	4.90 @ 5.25

**Pig-Iron.**—The market shows more activity than has been noticeable for five or six weeks. The inquiry for Iron has been much more vigorous, and a number of small transactions are reported at prices a trifle in advance of those offered last week. The tone of the market has unquestionably improved, though not sufficiently, perhaps, to justify the belief that the increased firmness is anything but a temporary flurry among purchasers. Furnacemen believe that consumers have finally reached the conclusion that additional concessions are out of the question and that they are anticipating an advance by placing orders at the present quotations. In any event the outlook has materially improved.

**Old Rails.**—The market is far from active and there is little doing even at the present price of \$21.50 for Old Americans.

(Later by Telegraph.)

Iron Ore sales aggregating about 300,000 tons are reported for the first three days of the week. Included in the amount are 150,000 tons from the Norrie Mine, at \$4.75, Cleveland delivery. Considerable non-Bessemer Hematite Ore, at about \$3.60, also for Cleveland delivery, has been sold since Saturday. The market has assumed a fair degree of activity and the present week's purchases seem likely to exceed those of any preceding six days since the opening of the season. Many of the consumers at Pittsburgh have still to enter the market.

## Louisville.

LOUISVILLE, KY., May 6, 1889.

**Pig-Iron.**—Very little has been done during the past week, and there is no change to note in the market. The feeling is still dull, and no sales of importance have been made. Small orders are numerous, but large buyers seem to be well supplied with Iron, the leading Pipe works especially. There are rumors of a contemplated reduction by the Thomas Iron Company, in the East, which can make little difference to any one save their own customers, as lower prices than theirs have been current quotations for some time past. We quote as follows:

Southern Coke, No. 1 Foundry, new classification	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry	13.25 @ 13.75
" " No. 1 Mill	14.75 @ 15.25
Southern Car-Wheel, standard brands	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry	19.50 @ 21.00
Hanging Rock, Cold Blast	20.75 @ 22.75

## Pittsburgh.

Office of The Iron Age, 77 Fourth Ave. }  
PITTSBURGH, May 7, 1889. }

There has been no material change in the general Iron business during the past week; it is improving somewhat, but so slowly as to be scarcely perceptible from one week to another.

The strike at the Rail mill of the Allegheny Bessemer Company still goes

on; there is strong determination on both sides to win, but the indications at present are that the company will come out on top, but not until after the loss of a good deal of time as well as money, to say nothing about the uneasiness and worry caused thereby. The report circulated that Mr. Andrew Carnegie had contributed to the support of the strikers is not generally credited, and, we believe, is denied by Mr. Carnegie, although some of the strikers still aver that it is true. The rumor that there is trouble among the stockholders of the Allegheny Bessemer Company is denied.

The reduction in freight on Iron went into effect on the 1st inst. The rate on Pig-Iron from the Mahoning and Shenango valleys to Pittsburgh is now 65¢ per ton, instead of 80¢, and the rate from Wheeling to Pittsburgh the same as from the valleys. The rate from the valleys to Wheeling is 80¢; as the haul is much longer than to Pittsburgh there is no fault found therewith.

**Pig-Iron.**—The market continues in an unsettled and unsatisfactory condition. Demand continues light and prices have further declined. The probability is that there will be a speculative feeling developed within the next week if the market goes any lower, as a good many people have about arrived at the belief that it is a good time to buy, and if so there will no doubt be a reaction. Consumers, however, as a rule, continue to buy for immediate wants, but just as soon as some larger consumers commence to buy freely there will be a movement all along the line. While we do not quote Forge Iron below \$13.75, cash, it is rumored that a sale was made at \$13.50, cash. However, there are but few sellers under \$14, cash, for standard brands. We quote as follows:

Neutral Gray Forge	13.75 @ \$14.00, cash
All-Ore Mill	14.75 @ 15.25, "
White and Mottled	13.00 @ 13.50, "
No. 1 Foundry	16.25 @ 16.75, "
No. 2 Foundry	15.25 @ 15.50, "
No. 3 Foundry	14.50 @ 14.75, "
No. 2 Charcoal Foundry	21.00 @ 21.50, "
Cold Blast Charcoal	24.00 @ 27.00, "
Bessemer Iron	16.00 @ 16.25, "

**Muck-Bar.**—No sales reported; offering pretty freely at \$26, cash. There appears to be but very little demand just at present. So far as we are advised there have been no sales below \$26, cash, although it was intimated that it might be bought for less.

**Spiegel.**—Is quoted at \$30 @ \$30.50, cash, for 20 %, and Ferromanganese at \$58 @ \$58.50, cash, for 80 %.

**Manufactured Iron.**—Merchant-Iron is still quoted on a basis of 1.60¢ @ 1.70¢ for Bars for first-quality Iron, 60 days, 2 % off for cash. Old Rail Iron is being offered at 1.40¢ @ 1.50¢. Demand continues light, but there will doubtless be an improvement just as soon as buyers can be convinced that prices have touched bottom. There is a continued good demand for Skelp-Iron, and some of the mills are sold from 60 to 90 days ahead; prices remain unchanged at 1.60¢ @ 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared.

**Nails.**—The Nail trade continues dull for the season, with but little prospect of any immediate change for the better. Advances from Wheeling within a few days are of a similar character. The Wheeling manufacturers have made a demand for a lower wage-scale, and it is probable that their demands will be complied with. Prices are still quoted at \$1.85 @ \$1.90 for 12d to 40d, 60 days, 2 % off for cash. Carnegie, Phipps & Co. quote Wire Nails at \$2.15 by the carload, 60 days, 2 % off for cash. It is still claimed that the Wire Nail is largely supplanting the Cut Nail.

**Wrought-Iron Pipe.**—There is a continued good demand, and the mills generally have about all they can do. Contracts have been made for 130 miles of

8 and 10 inch Pipe for early delivery to be used in laying a line from Ohio gas fields to the city of Sandusky. There are intimations of a still further contract for 400 miles of Pipe, but the particulars have not yet transpired. A Pipe line is also being laid from the Indiana gas fields to Louisville, Ky.; the work of laying the Pipe across the lower Ohio River has been commenced. The combination prices are being faithfully adhered to. Discounts on Black Butt-Welded Pipe, 55 %; on Galvanized do., 47½ %; on Black Lap-Welded, 67½ %; on Galvanized do., 55 %; Boiler Tubes, for 2 to 2½ inch, inclusive, 62½ %; 5½-inch Casing, 62½ % off; other sizes, 60 % off; 2-inch Tubing, 18¢ per foot, net; 8-inch Line-Pipe, 20¢ per foot, net; 6-inch do., 58¢; 8-inch do., 90¢.

**Old Rails.**—The Old Iron Rail market continues dull and weak. Sale of 1000 tons reported at \$22. On the other hand, there is considerable inquiry for Old Steel Rails, with light offerings, and for these the market is firmer; may be quoted at \$19 @ \$20 for Long and \$17.25 @ \$17.50 for Short Lengths.

**Steel Rails.**—Heavy sections are still quoted at \$26 @ \$27, cash, at mill, according to character of order, delivery, &c. As noted elsewhere, the strike at the mill of the Allegheny Bessemer Company still continues.

**Blooms, Billets, &c.**—Bessemer Steel Billets and Blooms are still quoted at \$27 @ \$27.50 and Nail Slabs at \$26.50 @ \$26.75. Sale of 2000 tons Domestic Bloom Ends at \$17.25, cash.

**Railway Track Supplies.**—No change in prices. Spikes, 2¢, 30 days, f.o.b. cars at works. Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts. There is an increased demand, as there nearly always is at this season of the year.

**Old Material.**—Continues very dull and prices are weak; in a word, it is a buyer's market. Concessions have to be made in order to effect sales, and the demand is of a hand-to-mouth character. Sales of No. 1 Wrought Scrap have been made as low as \$18.50 per net ton. No. 1 Wrought Turnings may be quoted at \$18 @ \$18.50; Old Car Axles, \$24.50 @ \$25; Cast Scrap, \$14 @ \$14.50 gross; Cast Borings, \$11.50 @ \$12. Small sale of Old Car Wheels for foundry use at \$18.

## New York.

Office of The Iron Age, 66 and 68 Duane street. }  
NEW YORK, May 8, 1889. }

**American Pig.**—The largest single producer in the Lehigh Valley announced on Monday to its regular customers that the price to them on Foundry Iron, deliverable on contracts during the months of May and June, would be \$15.50, at tidewater, for No. 2, and \$16.50 for No. 1. It is distinctly stated that these figures do not apply to new business. The cut of \$1.50 is not quite so serious as it might appear at first sight because at their nominal figures of \$17 and \$18 the company in question were really considerably above the market, equivalent grades having been freely offered at lower figures, while, as we have stated, Southern Irons have been offered as low as \$16 for No. 1. It is claimed by the friends of the company that in reality they have been sustaining the market thus far, and that by their action now they merely meet the market. So far as Northern Irons are concerned the price of \$16.50 is a cut of at least 50 cents, so that the statement made alludes to Southern Iron alone. The leading Virginia company, who produce an Iron of acknowledged excellent quality, have met the cut, by reducing their price by \$1.50. The attitude of the Northern producers in this market is not yet clearly defined. Some commend the action taken; others

criticise it sharply as unnecessary. So far as the Southern furnaces are concerned they state their determination to hold their trade, and to them some margin for a further lowering is still left before they reach the parity of Western prices. With No. 1 Foundry selling in Cincinnati in small lots at \$14.75, the price at Birmingham, Ala., is \$12. Adding the freight of a shade under \$4, \$16 here can be done. Some of the Southern companies expect that some of their orders taken at a higher price for long-time delivery early in the year at higher prices will be canceled, especially in those cases where there has been delay in delivery. It is possible that the furnace companies will decline to renew them on a lower basis, in which case the buyers will be in the market again. It is not believed, however, even by those who would thus lose business, that the consumers would find any difficulty in placing their orders at \$16 with some of the furnaces which have lately blown in. The avowed purpose of the Lehigh company alluded to was to quicken deliveries during the months of May and June. It is generally believed in the trade that the company in question were driven to the step taken by the fact that their customers purchased other Irons in the open market at lower figures, and delayed deliveries of the Lehigh Iron on their season contracts. The ability of the Lehigh company in question to manufacture at the prices stated is above all question. It is generally understood that they can place their Iron at tidewater at \$18.50 as the average of the grades. They are now producing at the rate of nearly 8000 tons a week. But it is equally well known that there is not a single plant in Eastern Pennsylvania, New York or New Jersey shipping Foundry Iron to tidewater markets as its principal outlet which can come anywhere near the same figure. In fact, it is a serious question whether a single one can escape loss at the prices now ruling. There must be a sharp restriction of output, and our monthly blast-furnace returns show that reduction has already begun. We know that a number of plants seriously contemplated blowing out, and others are now likely to reach the same decision. So far as the Southern furnaces are concerned, we doubt whether the latest developments in the market will cause any stoppage whatever. They cannot close up the Thomas Iron Company, but they can undoubtedly live where the other furnaces in the Lehigh and Schuylkill Valleys, in New Jersey and New York are losing money. This, however, it should be distinctly understood, refers only to those furnaces which are running on Foundry Irons of standard grade for the open market. The whole question has nothing whatever to do, first, with the plants in the Lebanon Valley, who can outlive any manufacturers in any part of the United States. It has nothing to do with those furnaces in the whole territory named which are producing Bessemer Pig, or with those which are making Mill Iron for their own use, nor furthermore with a few specially well-situated furnaces making Mill Iron for the open market. These facts should be thoroughly understood. We quote No. 1 Foundry, \$17 @ \$17.50; No. 2 Foundry, \$15.75 @ \$16.25, and Gray Forge, \$14.50 @ \$15.25, with Southern Iron at \$16 @ \$16.50 for No. 1 Foundry.

**Foreign Ore.**—Freights on Foreign Ore are a little lower, having declined from 15/ @ 15/6 to 14/ @ 14/6 on Maraballa, which are generally about 1/6 @ 2/ higher than freights from other points. Mokta Ore is quoted about 10¢ per unit, ex-ship, with a moderate demand.

**Spiegeleisen and Ferromanganese.**—The only sale reported is a lot of about

500 tons of 20 % at about \$27.50, New York. Ferro is selling in a small way at \$56.50 @ \$57.

**Structural Iron and Steel.**—A moderate business in being done in a small way for local architectural work. We continue to quote: Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3¼¢ @ 4¢.

**Bar-Iron.**—The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.85¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Steel Rails.**—Eastern mills report only a few small sales. A Pittsburgh mill has taken 11,000 tons for an Alabama road at a delivered price. It is intimated that the net price is higher than figures lately made because of the character of the financial arrangements. The Chicago mills are reported to have taken about 12,000 tons lately for the allied lines of one of the transcontinental roads. A meeting of the rail manufacturers is to be held in Philadelphia on Saturday. We quote the market \$27 @ \$27.50 at Eastern mills for large lots. So far as can be learned, 20,000 tons being offered on behalf of speculators have not yet been placed.

**Wire-Rods.**—There is some inquiry for Foreign Rods, but prices continue high, restricting business to very narrow limits. We quote, nominally, \$42 @ \$42.25 for small lots.

**Old Rails.**—The market is featureless, with prices nominally \$22 @ \$23.

**Scrap-Iron.**—We note a sale of about 100 tons at \$20, f.o.b. cars, Jersey City.

**Rail Fastenings.**—Very little is doing. Spikes continuing \$1.90 @ \$2 and Angles 1.75¢ @ 1.80¢ in large lines.

## Financial.

Trade circles are gradually recovering from the condition of "suspended animation" incident to the Centennial celebration, the streets having been effectually barricaded for three days, and in some lines of traffic a fair business is in progress. As a whole, however, the impulse expected from the presence of numerous visitors from a distance has not been realized. In the dry-goods trade a considerable force of out-of-town buyers was noticed, but activity is more perceptible in the shipments by cheap transportation routes, available since the opening of navigation. Lake vessels are taking the bulk of eastward shipments from Chicago. The Clearing-House returns show a decrease in New York of 34 % compared with the same work last year, and in Boston a decrease of 20 %. Outside of New York there is an aggregate increase of 27.4 %. Just now attention is directed to the proceedings of the Interstate Commerce Committee at the Fifth Avenue Hotel, the special point of inquiry under the lead of Senator Cullom being the relation between the railroads of this country and Canada and the disabilities said to be placed by the Interstate Commerce law upon American roads in competition with those of Canada. Chairman Albert Fink, of the Trunk Line Association, on Monday was interrogated for four hours. He described himself as "the head of a bureau whose object is to arrange joint tariffs between competitive points in such a way as to secure uniformity and to maintain the rates established." The Grand Trunk line was in the association, and the Canada Southern was operated under a lease by the Michigan Central. The Canadian Pacific has as yet

had nothing to do with the association. The Grand Trunk has for a dozen years had a differential rate on through business from Boston and New England of 10¢ @ 100 on first-class freight, and a similar proportion on cheaper classes. It has also exacted, without consent of the other roads, a differential of 15¢ on New York business by way of New London. If it were compelled to charge the same rates as the other trunk lines it would have to go without business. The presidents of the Erie, New York Central and other railroad companies were in like manner called on for testimony. Another notable fact is the announcement of a reduction in the price of iron, also the selling of coal by the Reading Company at a concession from the prices made in New York. The breadstuffs and grain markets seemed to be working under better conditions as concerns the export business, but cables are again lifeless and in some instances easier. A British steamer has been chartered to load corn from this port, the first grain charter reported here for a long time. The cotton and coffee speculations have been livelier. Sugar refiners have been compelled to reduce prices ¼¢ @ ½¢ because of light buying.

The Stock Exchange market did not open until Thursday, when the tone was strong, with considerable buying on European account. On Friday there was a further improvement, Chicago, Burlington and Quincy leading on reports of increased earnings, the other grangers and Atchison, Topeka and Santa Fé closely following, and Northern Pacific preferred being favorably affected by news of the traffic arrangement with the Wisconsin Central. On Saturday the market was strong at the opening, but became irregular. On Monday the chief interest was in Atchison and Reading, Boston houses buying the former freely in prospect of success in the reform movement at the annual meeting to-day. The reduction of \$1.50 a ton for pig-iron by the Thomas Iron Company had little effect upon the coal stocks. On Tuesday the market was dull and irregular. The features were Atchison, Reading, Union Pacific, Northern Pacific preferred, Oregon Transcontinental and the grangers. The latter were well supported and gave evidence of some inside buying. The earnings of the granger roads are now beginning to show the importance of the strict adherence to the Interstate Association agreement.

United States bonds were firm, the latest sales reported at the board being \$10,000 4s registered at 129½ and \$20,000 4s coupon at 129½. Quotations as follows:

U. S. 4½s, 1891, registered.....	108¾
U. S. 4½s, 1891, coupon.....	108
U. S. 4s, 1907, registered.....	129¼
U. S. 4s, 1907, coupon.....	129½
U. S. currency 6s.....	121

The regular financial statements for the month of April issued by the Treasury Department show the continuance of increased revenues. The Treasury surplus is greater by \$1,500,000 than a month earlier, and \$7,000,000 greater than when the new Administration began. It is still only about half as large, however, as on May 1, 1888—\$55,600,000, compared with \$110,200,000.

The weekly statement of averages of the Associated Banks for four days show an increase in loans of nearly \$2,000,000, a loss in lawful money of nearly \$4,000,000, and as the deposits have not changed materially, the surplus is also reduced nearly \$4,000,000. The loss in lawful money is due partly to absorption by the Treasury Department and partly to the withdrawal of \$3,000,000 for export. The surplus reserve is now \$9,522,575, against \$18,170,075 in the corresponding week last year, \$4,522,600 in the preceding year and \$11,113,525 in 1886. Although the surplus is large enough at present for all probable contingencies, the experience

of the week shows how easily embarrassments might arise in case of large demands from abroad or restricted offerings of bonds. The alleviating feature is continued liberal exports of commodities. Last week the imports were above the average, the valuation being \$9,848,500, of which nearly \$3,000,000 represents dry goods. Since January 1 the total is \$178,870,900, as compared with \$171,102,000 for the corresponding time in 1888 and \$165,500,000 in 1887. Exports dropped to \$4,299,052.

Rates for money were temporarily advanced by the unexpected withdrawal of gold for export and a simultaneous calling in of loans by a prominent banking-house, but money was promptly offered in any needed amounts, and rates again became normal. No change is noticeable in the market for time loans, and rates remain as last quoted— $2\frac{1}{2}\%$  for 60 to 90 days,  $3\frac{1}{2}\%$  for four to six months and  $3\frac{1}{2}\%$  for six, seven and eight months. Commercial paper is still in good request from all quarters, but rates are unchanged at  $3\frac{1}{2}\%$  @  $4\%$  for 60 to 90 day indorsed bills receivable and  $4\frac{1}{2}\%$  @  $5\frac{1}{2}\%$  for longer dates. It is remarked that for some reason not readily apparent the supply of paper offering is materially increased, chiefly from the interior.

The posted rates for bankers' sterling were advanced to \$4.88 for 60-day and \$4.89 $\frac{1}{2}$  @ \$4.90 for sight. The market is dull and a shade easier.

Stockholders representing two-thirds of the stock of the Union Bank, in Fifth avenue, wound up the affairs of the bank by selling their interest to the Columbia Bank, of Fifth avenue, and sent in their resignations. The trouble was lack of business.

## Imports.

### Hardware, Machinery, &c.

Atlas S. S. Co., Anchors, 4  
Blum, E. M., Hardware, cs., 52  
Boker, Hermann & Co., Nails, cs., 7; Anvils, 164;  
Arms, cs., 44; Iron-ware, cs., 6  
Commercial Express Co., Hardware, cse., 1  
Corbiere, Fellows & Co., Mach'y, cs., 7  
Curley, J. & Bro., Cutlery, cs., 2  
Clark, G. A. & Co., Mach'y, cs., 222  
Dolge, Alfred, Mdse., cs., 7  
Downing, R. F. & Co., Mach'y, pgs., 14  
Field, Alfred & Co., Hardware, pgs., 13  
Foley, Ed., Mach'y, cs., 4  
Folsom, H. & D., Arms Co., Arms, cs., 6  
Frasse, P. A. & Co., Mdse., cs., 9  
Godfrey, Chas. J., Arms, cs., 16  
Gurney, Fred B., Mdse., cs., 3  
Hoe, R. & Co., Mdse., cs., 6  
Hammacker, Schlemmer & Co., Nails, cs., 40  
Hartley & Graham, Arms, cs., 24  
Hermann, Schutte & Co., Hardware, cs., 8  
International Boiler Co., Furnace Doors, 3;  
Boiler, 1; Fittings, cs., 6  
Knobel, H. & Co., Hardware, cs., 4  
Lundborg, C. G., Iron-ware, bxs., 11  
Lau, J. H. & Co., Arms, cs., 14; Cutlery, cs., 4  
Lawrence, J. W., Anvils, 256  
Merchants Despatch Co., Arms, cs., 8; Machine, cse., 1  
Naylor & Co., Mach'y, cs., 2  
Newton & Shipman, Files, cks., 4  
Pritzlaft, J., Hardware Co., Mdse., cse., 1  
Reisinger, Hugo, Machine Parts, pgs., 34  
Richard, C. B. & Co., Cutlery, cs., 5  
St. Louis, Arms for, cs., 47  
Schoverling, Daly & Gales, Hardware, cs., 5  
Tiebout, C. H. & Son, Anvils, 27  
Taylor, Thos., Mdse., cs., 4  
Terkulle, J., Hardware, cs., 20  
Wallingquist, A., Mach'y, cs., 25  
Ward, Jas. E. & Co., Bolts and Nuts, cks., 8  
Ward, Asline, Mdse., cs., 2; Nails, cks., 166; Iron-ware, cs., 7  
Witte, John G. & Bro., Cutlery, cs., 5  
Wright, Peter & Co., Machine parts, cs., 12  
Wiebusch & Hilger, Lim., Guns, cs., 28; Gun-Barrels, cs., 12; Hardware, pgs., 12  
Order.—Mach'y, pgs., 46

## Coal Market.

The Anthracite Coal trade has a more cheerful tone, there being of late more disposition to buy than for several months past. The improvement, such as it is, is probably due to the advancing rates of freight to Eastern ports, as the increased cost of vessel transportation, it is reasoned, may more than offset any advantage to be gained by longer waiting. Just now interest among local jobbers is absorbed by the pending contract with the Brook-

lyn School Board, competition being sharp, at low figures. The main fact to be noticed is the better inquiry. Pea Coal, Free-Burning, may be quoted \$3 alongside, and the harder brands 15¢ @ 20¢ less. Buck-wheat is \$2.25 alongside. The regular companies claim that prices are fully held and are firm, also that individuals are getting more than they did. The Reading Company are reported to be cutting prices for the line trade 10¢ @ 20¢ below the circulars. The belated and suppressed official returns of Anthracite Coal tonnage for March show that the production for the month was 2,103,068 tons, a decrease of 582,666 tons as compared with March, 1888. For the year to March 31 the tonnage was 6,823,254 tons, a decrease of 646,489 tons. The Wyoming region fell off 1,957,436 tons as compared with 1888, and the Lehigh and Schuylkill regions increased 949,541 tons and 361,406 tons respectively. In the three months the Reading is ahead 431,290 tons, the Lehigh Valley 214,340 tons, the Jersey Central 97,577 tons, and the Erie 85,201 tons. All the other roads fell off in tonnage, the Lackawanna having the greatest loss, 842,878 tons. The stock of Coal at tide increased 61,567 tons during March.

The Anthracite production for the week ending May 4 is 498,651 tons, as compared with 552,000 tons for the same week last year, and the total since January 1 is 9,504,759 tons, a decrease of 1,456,000 compared with 1888. It is understood that the Lehigh Valley Railroad Company have withdrawn their opposition to the publication of the complete monthly Coal statistics. The collieries drawn in the Schuylkill region to fix the rate of miners' wages for March showed the average price of Coal at the mines to be \$2.39. The rate of wages is, therefore, 4 % below basis.

The Bituminous trade is dull, now that nearly all the usual spring contracts have been filled, but there is a good amount of Coal in course of delivery. It is noticed that as a rule no prices are made public, the supposition being that pool prices prevail. It is charged, on the other hand, that nearly all the recent large contracts were closed at a concession made by shippers in the mining regions.

Respecting the decision awaited in the case of Coxe Brothers the Philadelphia Press says: "The doubt about the decision of the Interstate Commission in the Coxe suit against the Lehigh Valley unsettles the Coal trade. The buyer holds off on the idea that the decision may lower the tolls. He is probably mistaken, as the issue is too important to be brought to a sudden conclusion. If the Interstate Commission decides against the company on the question of tolls an appeal will no doubt be taken to the Supreme Court, which would cause a delay of several years, but in the meantime it is not likely that the high tolls for Anthracite Coal could be kept up. Mr. Gowen's argument in the Coxe case has been circulated about a good deal during the past ten days, and, while it is often sophistical, it contains many points which strongly appeal to a sense of right. There is no doubt whatever that in the next two years Anthracite Coal tolls will be reduced to the basis of, say, \$1.25 from the Schuylkill mines to tide. This means a great change in the earning capacity of the Coal-carrying roads. Another matter of importance which will come up in the near future is the relations of such companies as the Reading Coal and Iron Company, the Lehigh and Wilkes-Barre Coal Company and the Lehigh Valley Coal Company to the State and to the railroad companies which control them." The Record says: "It is reported that the New York, Ontario and Western Railroad, which is now building an extension into the northern Coal field, has contracted to carry Coal

to market for 40 % of its selling price, a rate that will be decidedly lower than that at present in force."

## Metal Market.

**Copper.**—Since our last week's report Copper has been steady in London at £28. 5/ for both spot and futures, sales aggregating 600 tons. Sales to consumers have been made in this market of Lake Copper with the price to be fixed hereafter. Toward the close of this week the American delegates of mining companies are expected to arrive on their return trip from Europe. We shall know then what the result of their labors over there has been. We print the story of the Boston Herald elsewhere. It is contradicted by the mining companies who claim that a representative has remained abroad with full power to act, and that 12¢ is likely to be the figure settled upon for Lake. The syndicate contract with the mining companies under which no deliveries were to be made for two months expires on the 15th inst. The statistics of visible supply in England and France May 1 showed a decrease of 400 tons in April, being 124,470 tons. During the first nine months of the fiscal year there were shipped from the United States 13,469,686 lb of Ingot Copper, against 18,809,506 same time last year. Spanish exportation during the first two months of the year amounted to 180,156 tons of Pyrites, against 113,869 in 1888 and 128,200 in 1887; of Precipitate, 3811 tons, against 3344 and 4914 tons.

**Tin.**—From £91. 5/, spot, Tin gave way in London since our last report to £89. 10/ yesterday, and futures from £92 to £90. 7/8, owing, it is presumed, to the unfavorable statistics, which exhibited an increase in the visible supply in Europe and America on the 1st inst. of about 500 tons, in consequence of more having been shipped from Singapore. Sales for the week in England summed up 600 tons. Our own market was moderately active at generally drooping figures, 10 tons spot bringing 20 $\frac{1}{2}$ ¢, and declining to 20¢ subsequently, while 20 tons June fetched 20¢ and 10 tons September 20 $\frac{1}{2}$ ¢. The imports of Tin into the United States during the first nine months of the fiscal year were 25,464,667 lb, against 23,573,978 last year. At the Metal Exchange on first call this forenoon 60 tons May Tin brought 20 $\frac{1}{2}$ ¢. In a jobbing way spot Tin closes at 20 $\frac{1}{2}$ ¢ @ 20 $\frac{1}{2}$ ¢ to-day. **Tin-Plates.**—The market has been quiet and prices are a shade easier. In Liverpool there has been a decline of 3d per box, chiefly owing to the drop in Pig-Tin, but also to a lack of demand. The import of Tin-Plates into the United States during the first nine months of the fiscal year was 527,891,085 lb, against 452,030,389 last year. We quote, large lines, ordinary brands, per box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.70; Ternes, \$4.12 @ \$4.30; Coke Tins, \$4.25 @ \$4.35, and Wasters \$4.12 $\frac{1}{2}$  @ \$4.15.

**Lead.**—There has been a good deal of uncertainty and excitement; the pros and cons of the question of the exclusion of Mexican Ore we discuss editorially in another column. Sales in the open market aggregated 1500 tons, at all sorts of prices from 3.75¢ to 3.95¢, the closing quotation being 3.95¢ @ 4¢, and at the West, 3.60¢ @ 3.65¢. Spanish exportation during the first two months was 22,648 tons, against 23,261 in 1888 and 24,268 in 1887. On first call this forenoon there were sold at the Metal Exchange about 50 tons June at 3.92 $\frac{1}{2}$ ¢, and 35 tons July at the same figure.

**Spelter.**—Has remained featureless at 4.62 $\frac{1}{2}$ ¢ @ 4.65¢ for Common Domestic, with little doing, and 5 $\frac{1}{2}$ ¢, nominally,



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# Hardware.

Business in this market was seriously interrupted, and for the greater part of last week practically suspended, by the centennial celebration. The present week opens with a moderate volume of trade and without marked changes in the character of business, prices being, however, weak and irregular, the tendency being toward lower quotations in several lines. The decline in the price of iron contributes to this result. It is, however, to be borne in mind that the general line of goods is unchanged and a fairly satisfactory condition of things exists throughout the country.

We continue below the review of business which is based upon detailed and specific advices in the different States, and the reports given refer, it will be seen, to the far West and the Pacific Coast:

## Montana.

Business in general is good, with encouraging prospects for the coming year. The activity in mining induces a very satisfactory business in Hardware and related lines, and merchants interested in this business report a considerable increase over last year for a corresponding time. Stocks in general are fair, and in some cases, in order to accommodate a very satisfactory business, are heavier than usual. Throughout the State there is a hopeful feeling, and the development of mining and the success which attends it promise well for future business. Travelers who visit the trade throughout the State generally give gratifying reports as to the condition of things coming under their observation, and their orders indicate a healthful state of trade. There will be a good deal of building in some of the principal points, and the construction of railroads and activity of mining enterprises promise well for the future.

## Wyoming.

Business is reported as reasonably good and the outlook fair, with the intimation, however, that there is a prospect of a dry season and low price for cattle. Owing to the distance from market, fairly full stocks are generally carried. The prospect for building is only fair, and money is scarce and collections slow. There appears to be a general and steady development of the resources of the Territory, and the prospects for a good trade are all that could reasonably be expected.

## Colorado.

General business is in excellent condition, and reports on this point are very satisfactory, indicating that in many places trade is better than for several years past owing to the continued settlement and development of the country. Stocks of Hardware are in nearly all cases good and in many instances large, purchases having been stimulated not only by the low prices which have ruled, but also by the cut rates in freights, which induced many merchants to buy freely, especially in heavy goods, and some of our advices indicate that Barb Wire, Nails and other Heavy Hardware is being offered at cut prices in order to reduce stock. The volume of business in Hardware is satisfactory, and averages better than former years, our advices without exception indicating that merchants are doing an excellent trade. The fact that prices are low and weak is recognized. The outlook for building is also gratifying, and in some places is promising, the expectation being that there will be more than the usual number of houses erected. Agricultural conditions are also satisfactory. The crop last year was rather below the average,

but notwithstanding the generally satisfactory prices obtained collections have been sluggish, though they are probably to be regarded on the whole as fair, some merchants reporting them good and others in other parts of the State emphasizing the scarcity of money. The prospect of the crops for the present year is regarded as promising, the recent rains having improved the situation and removed to a good extent the apprehension of a dry season following a winter in which there was much less than the usual snowfall.

## Idaho.

Business has felt the effect of the damage of the last year from the grasshoppers, but farmers are not discouraged and have been making preparations for an increased acreage, and trade in Barb Wire and Implements has been good. It is not expected that business will be very good in the near future, but with abundance of rain the prospect for a good crop is regarded as promising and farmers are cheerful. Money is scarce and collections hard.

## New Mexico.

Owing to a very severe winter losses in stock have been heavy, and in consequence the spring trade has hardly been up to the average, though merchants have but little reason for complaint, and traveling salesmen report sales better than last year. The following additional points are given by one of our correspondents:

The Hardware trade, in sympathy with other branches, is fuller than usual, on account of losses in stock. Heavy Hardware and Iron have depreciated in prices and freights are lower. The prospects for trade for the fall months are good, as all the surplus cattle are sold to Montana buyers for future delivery. Prospects for building are dull. Collections are slow. The wool crop has not yet been marketed.

## Arizona.

Business in general is in fairly good condition. The cattle interests have been depressed on account of the low price of beef on hook of 1½ cents, against 2½ cents a year ago. The break also in the copper syndicate has had an injurious effect, but producers are hoping for a reaction. More interest is being taken in agricultural pursuits, which is having a salutary effect on the general prosperity. There is more activity in the mining interests outside of copper than has been seen for the past two years.

## Oregon.

The past year was exceptionally satisfactory and showed a decided increase in business over former years. Since the 1st of January trade has also been in good shape and Hardware has shared in the general activity. The agricultural conditions are favorable to business and point to an excellent fall trade. Stocks of Hardware are in some cases ample, and houses are buying freely according to their requirements. There is a good deal of building throughout the country and in the principal towns. The number of settlers who are coming into the country and the activity in real estate and general progress toward development render the outlook for business satisfactory.

## Washington.

The rapid development of the country stimulates business, and merchants are in good shape to take care of it, carrying ample stocks. Trade is satisfactory, and the prospect for the next few months is generally regarded as fair. But little complaint is made in regard to collections. The activity in railroad building contributes much to the general prosperity. Referring to the section lying west of the Cascade Mountains, and comprising what is known as the Sound Country, of which the principal towns are Seattle and Tacoma, we have the following advices:

Business is good, though there has been a falling off in both the production of coal and lumber by the lack of demand from California

for the former and from California and abroad for the latter. The mills engaged in supplying the local markets cannot begin to fill orders promptly. With the growth of towns and steady influx of immigrants, stocks not only of Hardware, but all other commodities, have been increased. The prospects for trade for the near future, as well as for the balance of the year, are excellent, and the number of buildings erected in all towns will probably be larger this year than any year before. It is too early to tell what the hop crop is likely to be this season, but the outlook for the wheat crop of Eastern Washington is very good, and, as almost all the wheat that is exported comes now to Tacoma for storage and shipment, it necessarily benefits the trade of this community.

## California.

Reports from this State are very satisfactory, and indicate a healthful condition of general business, with a steady and regular trade in Hardware, which is in good demand not only for staples but for goods generally, which are being purchased by merchants in quantities to meet their actual requirements. Stock are on the whole about average. Comparatively little complaint is made in regard to prices, which are pretty well held on their present low level. Competition is such that margins of profits are close. It is anticipated that there will be a fair and steady trade, especially as the prospects for building are in most cases referred to as promising. From Los Angeles we have advices that a large amount will be spent on public buildings this year, and from other points there are indications of more than usual activity in this line, especially in the central and northern portions of the State. The agricultural conditions are referred to almost uniformly as excellent, plentiful rains having given good prospects, so that if nothing unforeseen happens to prevent the crops will be excellent, and this will go far to secure good business and prompt payments. Some complaint is made of collections as having been slow, but they are probably to be regarded as about fair, and at present better than they were a few months ago. Many country merchants, however, are carrying very large accounts which they hope to be able to collect this year. Some towns are giving evidence of steady and healthful growth, while others are standing still and a few retrograding. The following summary, which comes from one of the largest jobbing houses on the Pacific Coast, will be valued as confirming or modifying the above:

Business in general is not as good as at same time last year, and is in fact somewhat dull, and the same remark applies to Hardware. Judging from the size of orders as they come in would infer that dealers are fairly well stocked, and are not ordering more than is actually necessary. Prices remain about the same as last year, and if there is any difference they are a trifle stiffer. The prospects for trade during the next few months are favorable, as is also the outlook for building, particularly in the central and northern parts of the State. Fruit and grain crops at present are looking first-class. Collections are fair, and the impression is that the fall trade will be large.

## Cut Nails.

The New York market is quiet, with quotations remaining unchanged at \$1.80 to \$1.85 for carload lots on dock, which, however, is occasionally shaded.

## Miscellaneous Prices

The following are the prices of the new line of Galvanized Sprinkling Pots which are manufactured by Sidney Shepard & Co., Buffalo, N. Y., the list being subject to a discount of 3½ and 10 per cent.:

No. 40, 8 quarts.....	per dozen, \$10.00
No. 50, 10 quarts.....	" 11.65
No. 60, 12 ".....	" 13.30
No. 70, 16 ".....	" 16.00
No. 80, 20 ".....	" 20.00

The Maryland Tack Company, Baltimore, Md., issue a discount sheet applying to Hardware list of prices January 2, 1888.

It is based on 72½ per cent. discount on American Iron Carpet, Steel Carpet and Swedes Iron Carpet Tacks.

The following are the prices of Stove Polish manufactured by the Nickel-Plate Stove Polish Company, 21 and 23 River street, Chicago:

	Per gross.
Nickel-Plate Paste, ¼ and ½ gross boxes.	\$6.00
Black Jack Liquid, ¼ and ½ gross boxes.	9.00
	Per pound.
Black Eagle Benzine, 5 and 10 lb cans.	\$0.12
Black Jack Water, 5 and 10 lb cans.	.12

Thomas Laughlin & Son, Portland, Me., have reduced the price of Iron Sheaves and Tackle Blocks, and now quote from manufacturers' standard list, as follows:

	Discount.
Common.....	70 %
Patent.....	60 %

They allude also to the quality of the goods and state that the above prices are subject to change without notice.

#### Items.

The partnership of Blanchard, Parker & Co., 71 and 73 North street, Boston, Mass., was dissolved by mutual consent May 1. Chester Parker will carry on the business at the old stand under his own name.

An announcement addressed to manufacturers appears on page 48, in which the advantages of Belleville, Ont., Canada, are referred to, as well as the inducements which are offered in the way of free land, exemption from taxation and financial assistance. Belleville is alluded to as having railway connections in every direction, and her water communication extends to Montreal on the east and to all the ports on the great lakes west.

Ball Bros. Glass Mfg. Company, Buffalo, N. Y., send out circulars describing Cooley's Patent Wood Jacket Butter Packages, which are made from tin-plate incased in selected ash jackets.

Everson & Co., Syracuse, N. Y., have secured a large five-story building, consisting of three stores, Nos. 8, 10 and 12 South Clinton street, between the Erie Canal and Railroad street, where they offer a full line of Builders', Blacksmiths' and Machinists' Hardware, Sash Doors and Blinds, Paints, Oils and Mill and Contractors' Supplies. In addition to the above their assortment of Guns, Revolvers, Ammunition, Cartridges and Sportsmen's Goods is alluded to as especially complete. Their establishment, with the advantages offered by their new location, is a very complete and extensive one.

Our readers will observe on page 718 the description of the Dandy Apple Parer, Corer and Slicer, which is manufactured by the Goodell Company, Antrim, N. H. The advantages possessed by this machine are there alluded to. The company do not intend to make any exclusive agencies this year, but allow their machines to be sold by the Hardware trade generally. It is intended to retail at \$10, and the company anticipate that it will have a large sale.

Allendale Lock Company, Lancaster, Pa., announce under date May 6 that they have discontinued the manufacture and sale of Scandinavian or Jail Padlocks known to the trade as Nos. 9, 10, 11, 12, 13 and 14; 119, 120, 130 and 140; 109, 110, 111, 112, 113 and 114; 209, 210, 211 and 212.

The W. Bingham Company, Cleveland, Ohio, send out a budget of new pages for their catalogue in order to bring it up to date in its revised lists and in its presentation of new goods which have been added to the assortment since their catalogue was issued. The large number of additions thus made illustrates not only the enterprise of the house, but the progress that is constantly being made in Hardware.

They have also issued their discount sheet No. 3, which is of interest as giving the present prices on the large variety of goods they handle.

The Coleman Hardware Company, of Morris, Ill., have removed their main office from 53 Dearborn Street to 59 Dearborn Street, Chicago, room 308.

New Process Twist Drill Company, Taunton, Mass., have issued a revised price list of their Hot Forged Straight Lip Increase Twist and Bit-Stock Drills. Their preface refers to the special features of these Drills and the advantages possessed by them, in the fact that they are hot forged and not milled, giving, they claim, a mild center, while by the process of forging the point and the cutting lip of the Drill are rendered especially tough and firm. The different patterns are illustrated, with list prices.

E. T. Barnum, Detroit, Mich., has issued a spring supplement, which embraces many seasonable goods, including Settees, Flower Stands, a variety of Wire constructions for the lawn, Crestings, Railings, Stable Hardware, &c. He also issues a separate catalogue of Reservoir Vases.

Walbridge & Co., Buffalo, N. Y., have issued their illustrated catalogue of summer goods. In it nearly 50 pages are devoted to Steel Goods, Rakes, Scythes, Hoes, Lawn Mowers, Spring Hinges, Freezers, Fishing Tackle, Haying Tools, &c. Among these Reed's Hay Fork Pulleys are shown.

The Delaware Case and Table Company, a recently-organized company located at Delaware, Ohio, write under date of 25th ult. that their productions for the present will embrace the Hunter & Smith Revolving Screw and Bolt Cases, Hill's Meat Cases, designed for the use of retail grocers and meat men, the Cragneili & Neff "Hollands Case," a device for the re-tailing of Window Hollands, the Hunter Store Truck, weighing but 15 pounds. They state that they also manufacture a line of Extension and Fancy Tables, that their facilities are good and that they are turning out each of the articles mentioned in a neat and attractive style and will add to the line as occasion demands.

Montague-Woodrough Saw Company have secured more commodious quarters at 104 Pullman Building, Michigan avenue and Adams street, Chicago, where they have ample facilities for filling orders for their B. M. T. Patent Tooth Saws. They also issue a circular describing this Saw and giving cuts showing the manner in which it is filed.

Wilcox, Crittenden & Company, Middletown, Conn., issue a circular describing their "Running Rings." This is a curious and ingenious Chain, composed of 88 interwoven rings, but the arrangement is such that the rings appear to disentangle themselves and run down the entire length of the chain.

The Chicago branch of the Ansonia Brass and Copper Company changed its location on the 1st inst. from 64 Washington street to 133 and 135 Wabash avenue. The company's new quarters are much larger than they were in possession of at their old location, and their facilities for the transaction of business are correspondingly increased. In connection with the Ansonia Clock Company they will occupy three floors and basement of the large double building. Gilbert M. Smith, Western manager of the company, states that while they have always carried a large stock of goods at Chicago they will now make it much heavier. Their line of Copper goods will be particularly large to supply Western markets, making a specialty of Sheets, Bottoms and Cornice

material. Their trade in these products of their works is steadily increasing in the West, and the expansion of their facilities had become imperative.

Holt Mfg. Company, Cleveland, Ohio, issue a circular illustrating their Combined Anvil and Vise, the invention of their John P. Holt. It is reported as meeting with a large and satisfactory sale. The vise is so made that it can be separated from the anvil by driving out the key with a single stroke of the hammer, and can be used as a clamp separate from the anvil. The back jaw has a lip projecting over upon the anvil, so that anything held by the vise can sustain heavy hammering.

Perry, Stearns & Co., 201 Madison street, Chicago, Ill., agents for the American Rubber Company, Boston, Mass., announce that they now carry a full stock of Rubber Garden Hose, and can also execute prompt orders for Steam Hose, Engine Hose, Suction Hose, Rubber Belting, Packing, &c.

F. G. Sherman & Co., Closter, N. J., manifest enterprise in the prosecution of their business in publishing for general distribution among those likely to be interested Hardware List No. 1, which gives a brief description and prices, without cuts, of some of the leading articles in the line of door furnishings, including Locks, Night Latches, Bell Pulls, Name Plates, Bolts, &c.

#### Obituary.

At a meeting held to-day at the rooms of the Hardware Board of Trade by the Hardware friends of Joseph B. Spencer, late of Brown Bros. Brass and Copper Rolling Mills, a committee was appointed to draft a set of resolutions to be suitably engrossed, expressing regret at his death and sympathy for his family. The committee consists of the following gentlemen:

JOHN C. MCCARTY, Chairman.  
JOHN G. WITTE,  
EDWARD BERNARD,  
JOHN H. GRAHAM,  
CHARLES X. CORDIER.

The committee was also instructed to have engrossed suitable resolutions upon the occasion of the death of Launcelot S. Gurney, only son of Fred. B. Gurney, killed at the late railroad accident near Hamilton, Ont.

#### Trade.

We have the following advices from Dudley Bros. & Lipscomb, Nashville, Tenn., in regard to trade in that section:

Trade has been quiet for the last 30 days in all lines except dry goods. The Hardware trade is always dull at this season of the year, though the trade in Cultivating Implements and Harvesting Machinery is very good. The jobbers here have only a fair stock of goods in store, as their trade has been better than usual in volume, and they do not generally replenish for the fall business until the last of June or July. The prices on all staple goods, such as Bar Iron, Nails and Barb Wire, are very low, Iron particularly being as cheap as ever known in the history of our market, though there are some signs of its stiffening a little. Prospects for building during the summer season are fully as good as usual. The weather has been exceedingly fine, and the farmers are very forward with their crops. There are indications for an abundant supply of all kinds of fruit. Collections are not as good as the prosperous condition of the country would seem to justify. The country banks all seem to have a surplus of money, but they don't seem anxious enough to loan it to the average country merchant. Our traveling men report health and prosperity and fine crop prospects in every section of our territory, and we are looking forward to a first-class summer and fall trade.

From a well-known house in Charleston, S. C., we have the following careful and interesting review of the market:

The general business of Charleston has been above an average, and is entirely satisfactory

to those houses who desire and seek their trade. The territory is increased by every effort, and gives encouragement for continued and persistent exertion. The Hardware business has been specially prosperous, and the volume of trade, both local and throughout the State, largely in excess of former years. While the advantages offered by dealers are fully as good as those of any other market, a thorough knowledge of the wants of interior merchants causes many of the largest dealers to rely exclusively upon Charleston for their supplies. The stocks carried are large and varied, very many lines being kept in stock that are entirely excluded by the general jobbing trade in Northern and Western markets. This is rendered necessary not only on account of distance from depot of supplies, but from the nature of the general business done by the patrons of this special business. Prices have been very uniform during the past year, and no marked changes have taken place. The impression is general that they have reached a point below which only disaster to manufacturers will result if reductions are either contemplated or enforced. It is rather early to forecast the future, as the crops from which prosperity is expected or derived are hardly yet planted, but the climatic conditions are more favorable this season than many we could name, and the general impression is that the year will be a very prosperous one. From every section of the State we have reports of building new and improving old structures, and the disposition to enlarge and improve seems to be general among all classes. This action must of necessity add largely to the value of all property and be beneficial to the State at large. As all the products of trade are derived from the products of the soil, from the expenditure of capital and labor in marketing the crop, and in handling it after being made so, a liberal yield and remunerative prices greatly increase legitimate margins, while sparse returns or prices barely removed from cost of production seriously affect the volume of business and reduce profits to a minimum. Collections have been very good, the general disposition of all being to reduce liabilities, and the percentage of bad or doubtful accounts is considerably smaller than usual. Having representatives in every portion of the State, we have been made thoroughly acquainted with every portion, and state with pleasure that the year has been a fairly prosperous one. A small section of the State suffered severely from freshets, but the area was so limited that the losses sustained, while very serious to those meeting them, did not materially affect the general prosperity. The completion of new lines of railroad and the construction of others has opened and will open additional territory, which will be vigorously canvassed and doubtless add considerably to the large trade already secured.

### Exports.

BY SHIP DELAINE, APRIL 15, 1889, FOR SYDNEY, N. S. W.

By Coombs, Crosby & Eddy.—48 dozen Axes, 40 dozen Edge Tools, 24 dozen Axes.  
By Healy & Earl.—8 cases Wood-Working Machinery, 3 packages Saws.  
By McLean Bros. & Rigg.—33 Lawn Mowers, 7 cases, 22 dozen Mouse Traps, 6 cases Door Hangers, &c., 1 dozen Scales, 2 packages Lampware, 6 Forges, 6 dozen Oil Stones, 11 dozen Bush Hooks, 22 dozen Locks, 14 gross Shade Rollers, 1/2 dozen Emery-Wheels, 1 dozen Boring Machines, 1000 Handles, 39 cases Sewing-Machines, 28 Store Truck 27 Pumps, 6 dozen Knobs, 3 dozen Picks.  
By V. Basanta.—9 dozen Sieves, 100 Clocks, 18 Clocks, 50 gross Paper Caps, 36 dozen Hammocks, 36 dozen Hoes, 42 dozen Wire Goods, 4 dozen Stepladders, 10 gross Blacking, 18 Wringers, 14 dozen Saws, 1 gross Lemon Squeezers, 20 gross Crayons, &c., 12 dozen Cow Bells, 6 dozen Grindstone Fittings, 10 Scales, 9 1/2 gross Lamp Goods.  
By R. W. Cameron & Co.—33 packages Buggies and Parts, 10 packages Buggies, 3 packages Hardware, 3 boxes Bolts and Nuts, 805 pounds Bolts and Nuts, 3 Wagon Jacks, 83 cases Handles, 6 cases Velocipedes and Wheels, 25,000 Slaters, 1 case Saddlery, 1 case Bells, 6 bundles Harness Dressing, 6 cases Saddlery, 8 cases Hubs, 15 crates Wheels, 5 bundles Harness Dressing, 1 case Harness Dressing, 1 bundle Rubber Bumpers, 1 case Saddlery.  
By Waterbury Clock Company.—2 packages Clocks, 2 cases Clocks, 10 cases Clocks.  
By Collins & Co.—137 dozen Edge Tools.  
By Frank Miller & Son.—4 gross Blacking.  
By J. L. Mott Iron Works.—1888 pounds Iron Stoves and Parts.  
By Welsh & Lea.—1 case Iron Bolts.  
By F. B. Wheeler & Co.—1/2 dozen Axes.  
By W. K. Freeman.—100 bundles Rims, 663 pounds Shellers, 1954 pounds Corn Mills.  
By E. K. Alburts.—35 dozen Axes, 5 gross Axle Grease, 1 case Tacks, 9 cases Hardware,

150,000 Primers, 12 Carriage Tops, 15 pairs Hubs.

By Strong & Trowbridge.—3 cases Pick Handles, 1 cask Lampware, 3 cases Bolts, 1 case Lamp Goods, 2 packages Tools, 50 bundles Wash-Boards, 1 case Saws.

By R. W. Forbes & Son.—13 packages Carriage-Ware, 60 gross Sewing-Machine Oil, 20 cases Sewing-Machines, 154 cases Sewing-Machines and Parts, 99 cases Sewing-Machines and Parts, 2 cases Sewing-Machines and Parts, 14 Die-Plates, 2 cases Horse Hoes, 15 packages Carriage-Ware.

By Mosbacher & Co.—15 1/2 gross Shears, 45 gallons Sewing-Machine Oil.

By Simpson, Hall, Miller & Co.—1757 pounds Plated-Ware.

By Edward Miller & Co.—7 boxes Lamp Goods.

By Manhattan Brass Company.—20 packages Lampware.

By Seth Thomas Clock Company.—168 Clocks.

By Recknagel & Co.—3 Washing Machines.

By W. & B. Douglass.—51 Pumps.

By Otto L. Patterson.—3000 pounds Cordage.

By Winchester Repeating Arms Company.—82 Guns, 40 sets Tools, 10,000 Metallic Cartridges, 20,000 Loaded Shells, 200,000 Primers, 25,000 Paper Shells, 23,000 Cartridges.

By H. W. Peabody & Co.—4 cases Fruit Presses, 1 dozen Wringers, 2 packages Stepladders, 6 dozen Sweepers, 6 cases Edge Tools, 22,400 pounds Barb Wire, 11,237 pounds Barb Wire, 2 cases Brushes, 10 cases Carbons, 2 crates Pumps, 10 cases Type-Writers, 1 crate Hardware, 18 gross Blacking, 5 packages Carriage-Ware, 240 pounds Bolts, 2 gross Grease, 12 dozen Brushes, 42 dozen Blacking, 20 cases Hardware.

By W. H. Crossman & Bro.—89 sets Axes, 2 cases Hardware, 2 cases Plow Parts, 1 1/2 dozen Clocks, 1 case Windmill Parts, 1 1/2 dozen Vises, 1 case Agricultural Implements, 2 boxes Oil Stones, 4 dozen Wringers, 2 dozen Wringers, 12 dozen Wash-Boards, 1 dozen Corn Shellers, 7 crates Carriage-Ware, 4 packages Pulley Blocks, 7 gross Tin Spoons, 6 cases Hardware, 30 cases Carriage-Ware, 7 dozen Dashers, 1 crate Carriage-Ware, 36 dozen Reflectors, 24 dozen Hoes, 28 cases Chimneys, 1 dozen Wringers, 9 cases Nails, 27 dozen Wash-Boards, 64 Castors, 2 1/2 dozen Cages, 5 cases Carriages, 4 dozen Hammers, 2 cases Hardware, 8 dozen Hoes, 8 dozen Hatchets, 288 Seats, 8 packages Pumps, 20 dozen Burners, 5 dozen Brushes, 4 cases Nails, 1 case Hardware, 3 crates Churns, 1 dozen Wringers, 36 cases Chimneys, 10 dozen Spades, 20 dozen Axes, 9 Refrigerators, 1/2 dozen Forges, 1 keg Staples, 3 packages Hardware, 2 gross Egg Beaters, 30 dozen Cages, 10 cases Hardware, 6 dozen Fruit Jars, 2 cases Hardware, 30 dozen Axes, 3 gross Handles, 24 dozen Wash-Boards, 3 cases Hardware, 3 packages Hardware, 16 cases Chimneys, 1 gross Brushes.

By A. Gintermann & Co.—5 cases Castings.

By A. Field & Co.—12 dozen Burners, 4 dozen Lamps, 2 1/2 dozen Plated-Ware, 100 Plated-Ware.

By Arkell & Douglas.—103 packages Carriage-Ware, 120 boxes Fruit Jars, 1 box Lampware, 9 cases Handles, 24 dozen Handles, 30 dozen Axle Grease, 2 cases Plated-Ware, 20 dozen Edge Tools, 6 dozen Saws, 4 gross Shade Rollers, 1 case Lamp Wicks, 17 packages Granite-Ware, 7 cases Lampware, 4 bundles Carriage-Ware, 4 packages Lamp Goods.

By Morris, Strouse & Co.—1 dozen Scales, 50 dozen Carpenters' Tools, 2 dozen Mallets, 5 gross Kitchen Tools, 2 1/2 gross Whisk Brooms.

PER BARK RUD. JOSEPHY, APRIL 18, 1889, FOR WELLINGTON, NEW ZEALAND.

By Arkell & Douglas.—12 dozen Traps, 1 dozen Meat Cutters, 8 cases Handles, 3 boxes Nails, 1 box Lead-Pencils, 1 dozen Ladders, 3 cases Saws, 6 dozen Edge Tools, 5 dozen Forks, 8 cases Hardware.

By R. W. Cameron & Co.—14 packages Agricultural Implements, 2 Buggies and Parts.

By H. W. Peabody & Co.—44,872 pounds Barb Wire, 2 cases Agricultural Implements, 2 cases Hardware, 132 cases Hardware, 1 case Firearms, 5 cases Hardware, 2 cases Pumps, 165 pounds Bolts, 3 cases Agricultural Implements, 2 cases Axes, 4 cases Hardware, 2 cases Agricultural Implements, 12 dozen Wash-Boards, 5 packages Agricultural Implements.

By Waterbury Clock Company.—8 cases Clocks.

By New Haven Clock Company.—1062 pounds Clocks.

By Edward Miller & Co.—6 packages Lamp Goods.

By W. H. Crossman & Bro.—3 cases Hardware, 37 dozen Axes, 116 dozen Handles, 1 box Hardware, 350 pounds Iron Bolts, 4 gross Shade Rollers, 1 box Hardware, 1650 pounds Horse Nails, 1350 pounds Horse Nails, 10 gross Lead-Pencils, 3 dozen Wringers, 1/2

dozen Scales, 3920 pounds Axle Grease, 1 1/2 dozen Hog Rings, 1 Tire Upsetter.

By R. W. Forbes & Son.—30 dozen Rakes, 1 dozen Mangles, 348 dozen Axe Handles, 3 packages Hardware, 4 cases Wringers, 18 packages Hardware, 17 packages Lawn Mowers, 2 boxes Wringers, 6 dozen Wrenches, 10 dozen Snaths, 15 dozen Hoes, 1 box Wringers, 18 dozen Adze Handles, 10 dozen Hammers, 1 case Seed Sowers, 12 boxes Oil Stoves, 5 1/2 dozen Axes, 1 case Hardware, 15 packages Hardware, 2 boxes Saws, 9 dozen Snaths, 11 dozen Forks, 12 dozen Hay Rakes, 4 packages Velocipedes, 6 dozen Perambulators, 3 packages Brass Goods, 3500 pounds Horse Nails, 1250 pounds Horse Nails, 1450 pounds Horse Nails.

By McLean Bros. & Rigg.—5 dozen Axes, 1 dozen Machine Oilers, 1 Washing Machine, 1 dozen Wringers, 3 gross Fruit Jars, 10 dozen Forks, 10 gross Lead-Pencils, 2 cases Bird Cages, 500 Handles, 3 cases Plumbs and Levels, 1 dozen Sinks, 13 sets Axes, 1 gross Shade Rollers, 30 Leather Dashers, 2 Boring Machines, 2 Lawn Sprinklers, 3 Drilling Machines, 5 dozen Broilers, 6 gross Sewing-Machine Oil, 21 Pistols, 4 dozen Forks, 2 Mangles, 4 dozen Wringers, 4 Lawn Mowers, 35 packages Nails, 2 dozen Sets Sad-Irons, 2 Bolt Clippers, 560 pounds Nails, 1 gross Egg Beaters, 5 dozen Lanterns, 7 dozen Braces, 2 dozen Razor Strops, 1 1/2 gross Snaps, 2 dozen Handles, 1 1/2 dozen Stone, 1 gross Axle Grease, 6 Stepladders, 10 dozen Mouse Traps, 4 racks Churns, 102 dozen Handles, 7 cases Augers, &c., 3 cases Cartridges, 11 Lawn Mowers, 5700 Metallic Cartridges, 2 cases Saws, 140 pounds Oil Stones, 3 cases Hardware, 18 dozen Axes, 3 gross Fruit Jars, 42 gross Wicks, 27 Stoves and 3 cases Parts, 24 cases Clothes Pins.

### FOR LYTTLETON.

By Orange Judd Company.—1 barrel Hardware.

By A. Field & Co.—2400 pounds Horse Nails.

By Samuel Lees & Co.—3 packages Wood-Working Machinery.

By Meriden Britannia Company.—1 box Plated-Ware, 1 box Plated-Ware.

By Arkell & Douglas.—60 dozen Handles, 2 dozen Axes, 6 gross Shade Rollers, 29 cases Hardware.

By R. W. Cameron & Co.—2 cases Horse Collars, 4 packages Dairy Goods, 41 dozen Axes, 15 dozen Axes, 25 dozen Axes, 50 dozen Axes, 250 cases Clothes-Pins, 10 dozen Whip Handles, 3 cases Ruling Machines, 30 packages Agricultural Implements, 88 dozen Handles, 12 dozen Locks, 125 pounds Horseshoe Nails, 2 1/2 dozen Churns, 12 cases Agricultural Implements, 131 packages Reaping Machinery, 25 bales Binder Twine.

By H. W. Peabody & Co.—22,428 pounds Barb Wire, 50 dozen Brooms, 32,052 pounds Barb Wire, 50 dozen Brooms, 20 dozen Machine Oil, 10 dozen Wash-Boards, 900 pounds Nails, 20 cases Stone, 1300 pounds Nails, 51 cases Hardware, 30 dozen Machine Oil, 2 Pumps, 4 cases Carriage-Ware, 1 case Agricultural Implements, 21 packages Lawn Mowers, 1 package Handles, 7 cases Tin-Ware, 2 cases Fiber-Ware, 1 case Bird Cages, 17 cases Lawn Mowers, 3 packages Agricultural Implements, 4 cases Hardware, 1 box Lampware, 1 crate Freezers, 2 packages Clocks, 53 packages Lawn Mowers, 13 packages Agricultural Implements, 16 packages Hardware, 700 pounds Nails, 3 Pumps, 1500 feet Hose, 12,815 pounds Barb Wire.

By R. W. Forbes & Son.—1 case Hardware, 2 cases Wringers, 1 case Towel Racks, 15 boxes Lawn Mowers, 2 boxes Toys, 13 packages Agricultural Implements, 2500 pounds Horse Nails, 6 boxes Wringers, 46 pounds Sash Cord, 1 case Wringers, 5 packages Churns, 1 box Sprinklers, 980 pounds Carriage Bolts, 30 dozen Brake Handles, 1 case Traps, 6 dozen Picks, 20 packages Wash-Boards, 1 case Store Trucks, 4 packages Oilers, 5 cases Apple Parers, 3 boxes Scales, 150 dozen Axe Handles, 17 packages Hardware, 2 packages Hardware, 3 cases Whips, 1 box Carriage Hardware, 3 packages Lampware, 4 packages Seed Sowers.

PER BARK PRINCESSEN, APRIL 24, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—16,900 pounds Nails, 400 Plows, 7274 pounds Manila Rope, 24 dozen Axe Handles, 3 Hand-Carts, 1300 pounds Nails, 7450 pounds Sash Weights, 10 Meat Safes, 4 dozen Metal Goods, 3 Trucks.

By W. H. Crossman & Bro.—100 dozen Hatchets, 3070 pounds Rope, 1 box Hardware, 5 gross Stove Polish, 40 dozen Hatchets, 30 dozen Brooms.

By J. Norton & Sons.—42 pounds Castings, 100 dozen Pick Handles.

By Arkell & Douglas.—3 corn Mills, 3 cases Lampware, 6600 pounds Barb Wire.

By Goulds Mfg. Company.—1 case Farm Bells, 1 case Farm Bells.

By R. W. Forbes & Son.—30 dozen Shovels.



### Combination Folding Bath-Tub.

The New Combination Folding Bath-Tub Company, Marshall, Mich., are offering to the trade a sanitary specialty which we illustrate in the accompanying cuts. Fig. 1 shows the folding bath-tub as it appears when closed, while Fig. 2 shows it in position for use, revealing the water-tank

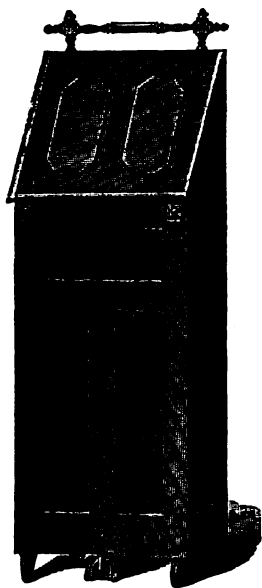


Fig. 1.—Bath-Tub Closed.

and heating arrangement. The apparatus combines water-supply, heating apparatus, bath-tub and waste-water exhaust in a very small space. The manufacturers allude especially to its convenience, as it does away with the necessity of having a hot-water supply in the building, and at the same time is a cheap, strong and durable apparatus. Furthermore, it is portable and can be placed in a furnished bedroom or other compartment, and when not in use presents the appearance of a cabinet. The two side-hinges that connect the top of the tub to the back of the heater, together with the two rollers on the bottom, permit an easy and partially automatic movement. The waste-water exhaust is, as will be

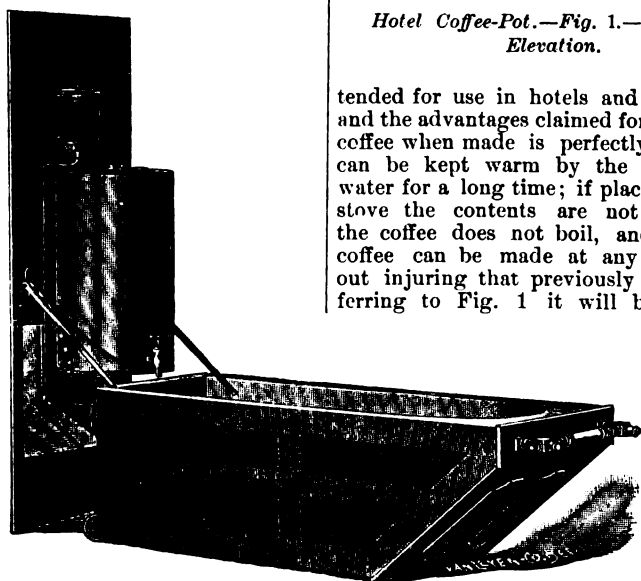


Fig. 2.—Bath-Tub Opened.

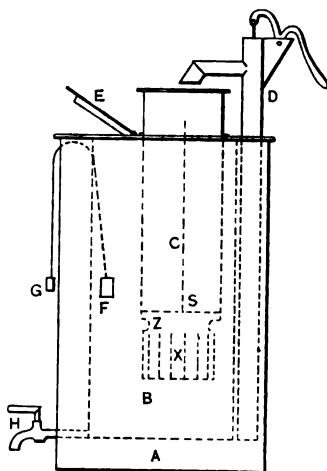
seen at the bottom of Fig. 1, so constructed as to connect and disconnect itself in folding and unfolding the tub. The heater, shown in Fig. 2, rests on galvanized-iron brackets and has a capacity for warming 25 gallons of water. Furthermore, it is arranged so as to let cold water circulate through the same to the tub, and can be

warmed in a few minutes with gas, gasoline or oil. The tub itself is made of heavy zinc or copper, while the cases are built of thoroughly seasoned wood and are tastefully finished.

### Hotel Coffee-Pot.

A novelty in coffee-pots is suggested by a correspondent of the *Metal Worker*, who writes to that paper as follows:

Coffee-pots have received their share of attention from inventors, and while the churn and farm-gate may be a few lengths ahead as regard numbers, the patented coffee-pots, if placed in a row, would make quite a showing. In Fig. 1 is shown the plan and elevation of a coffee-pot that has never been honored by a patent, so all of the readers of the *Metal Worker* are at liberty to construct as many as desired. This coffee-engine, as it might be called, is in-



Hotel Coffee-Pot.—Fig. 1.—Plan and Elevation.

tended for use in hotels and restaurants, and the advantages claimed for it are: The coffee when made is perfectly clear, and can be kept warm by the surrounding water for a long time; if placed on a hot stove the contents are not injured, as the coffee does not boil, and additional coffee can be made at any time without injuring that previously made. Referring to Fig. 1 it will be seen the

coffee pot is made double, similar to a water-cooler. The outer part A can be made 13 inches in diameter and any convenient height—say, 20 inches. As some water might be allowed to stand in A, it would be well to have a copper rim on the bottom, which would make the article about 22

inches high. The inside can B should be about 4 inches less in diameter and 2 inches shorter than A, as shown, the drawing being made to a scale of 1 inch to the foot. The strainer, or coffee-holder, C should extend above the top and within a convenient distance of the bottom of B. The bottom part of C at X is made smaller and perforated. A groove can be turned at Z, so that a flannel bag can be tied over the strainer X, to prevent any coffee-grounds from passing through.

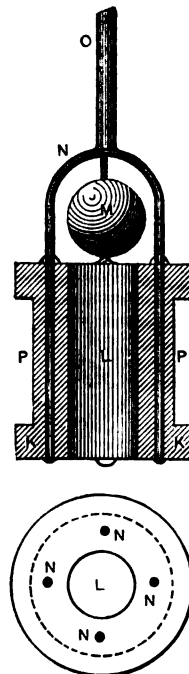


Fig. 2.—Plan and Vertical Section of Plunger for Pump.

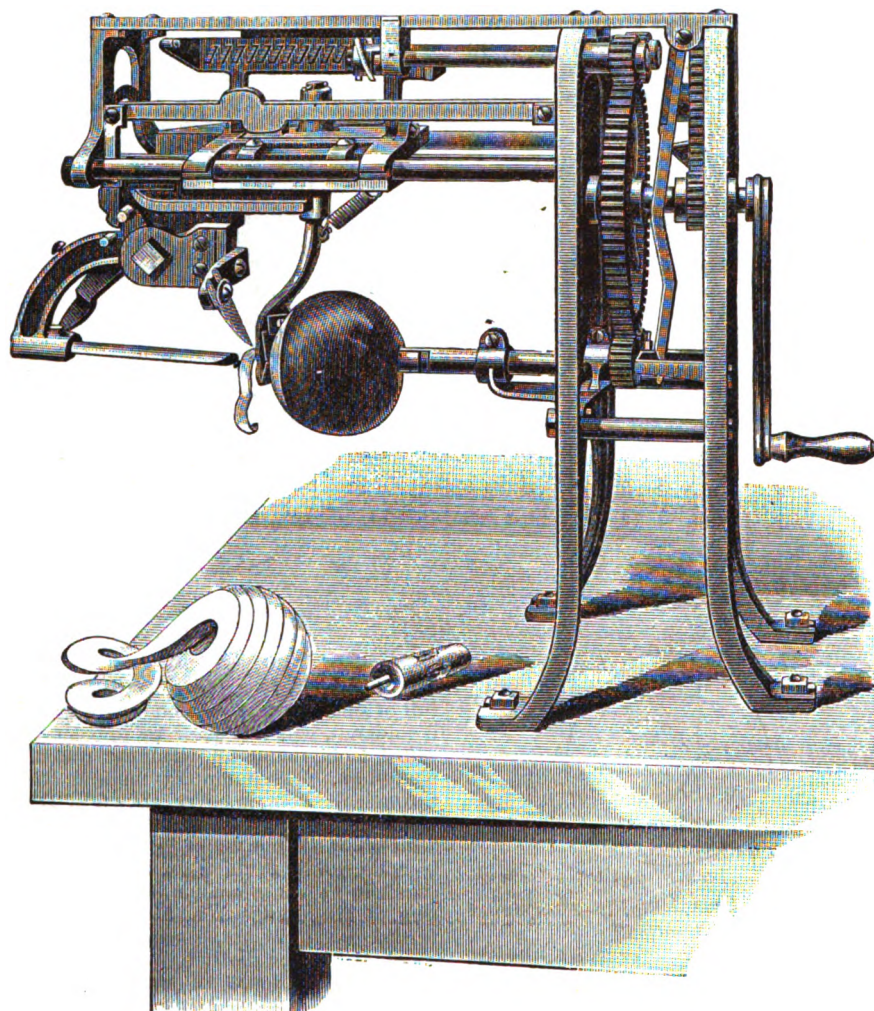
The weight S is a piece of tin punched full of small holes, to which a wire handle is soldered, which is used to prevent the coffee from rising up when the water is poured on. The pump D is made to slide through the hole in cover, shown by D in plan, and should extend to within about 2 inches of the bottom of A. This pump is made similar to those used on kerosene cans. In Fig. 2 are shown plan and elevation of the plunger; K K is a piece of turned wood, in shape something like a spool; L is the hole for the water to pass through; M a marble which acts as a valve; N two bent wires which pass through the spool as shown in plan and elevation, being secured by drops of solder applied at each end of the spool. To the two bent wires N is soldered the rod O, which connects with the pump handle. The groove P P is to be wound with candle wicking, which makes a good packing for hot water. The bottom valve can be made in a similar manner. This form of plunger was found to operate very well in hot water, though any kind can be used that will not impart a taste to or be injured by hot water. In elevation Fig. 1 F is a small float attached to the weight G by a chain passing from A to B through a bent tube, and as the coffee rises in B the weight is lowered, and by placing a gauge on the outside of the can the amount of coffee contained in B can be determined. The float and weight can be placed on either side of the front, so as to be out of the way, as shown on plan. The top of can is covered over and the edge of metal soldered to A, excepting the hinged cover E. The faucet H is connected with the inner can B in the usual manner.

In order to operate the coffee-pot, the space between A and B is filled with water, by means of a funnel, and the desired amount of pure ground coffee put in the

strainer X. This can be done in the evening when the coffee is intended for breakfast. The affair is placed on the stove, and after the water is boiling hot it is pumped into C and filtered through the ground coffee in X into the holder B, from whence it can be drawn as desired by means of the faucet. If more or stronger coffee is wanted the perforated cover S is removed and more ground coffee put in. In order to get all of the strength out of the grounds, the pump can be taken out, placed in B by putting the hole in cover shown at J in plan, when the coffee can be pumped through the grounds as long as desired. Only pure coffee should

The principal bearings have brass boxes, which are not affected by the acid of the fruit, and the point is made that as these brass boxes, which are simply drawn brass tubing, wear from the inside and give too much play, they can be replaced at a trifling expense, making the bearing good as new. In regard to the operation of this machine the following description may be of interest:

The bearing to which the paring, coring and slicing knife is attached is drawn toward the apple by the screw gear at the top, the paring-knife passing around the apple, taking off the paring, and the coring-knife being drawn through it. This is done by two turns of the crank, and the third turn, by a reverse motion,



*The Dandy Apple Parer, Corer and Slicer.*

be used for the purpose, as chicory will prevent the water from filtering through. In the plan and elevation similar letters refer to similar parts.

#### **The Dandy Apple Paring, Coring and Slicing Machine.**

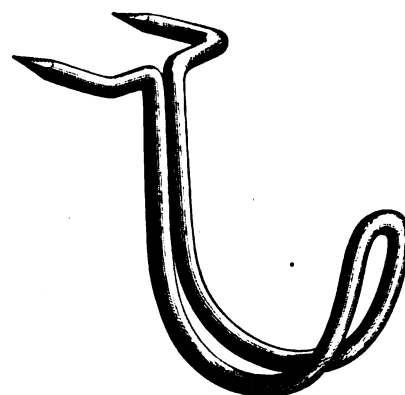
This machine is designed especially for the use of evaporators, canners and bakers, and is manufactured by the Goodell Company, Antrim, N. H. The general construction is similar to the Eureka parer, which was brought out a few years ago, but it is a lighter and smaller machine, for hand use only. The point is made in regard to it that it is an exceptionally fast working machine, paring, coring and slicing an apple with three turns of the crank, instead of four, as in other machines. The paring, coring and slicing arrangement is the same as that used on the Eureka parer, the three knives being entirely separate and independent of each other. The machine can be used to simply pare or pare and core, or pare, core and slice, as the operator desires.

the carriage is thrown back in place for another apple to be put on, and the apple is taken off by the coring-knife and the core is pushed off by means of a rod which passes through the center of the fork spindle and is pushed off by a cam on the gear, striking a lever and pressing it forward toward the fork spindle or against the end of the push-off rod.

The company hold patents on the paring-knife, coring-knife and the fork used in the machine. The knife-head hangs on a swivel and is held up to the apple by means of a spiral spring. Thus there are two adjustments, which are referred to as allowing the paring-knife to get into the irregularities while it also takes a very thin paring, and it is so constructed that the paring will not clog in the knife-head. The patent fork is constructed of steel tines held in place by a brass ferrule, so that if one or more tines become damaged or broken, the broken tine can be removed and a new one substituted at a trifling expense. With this fork, which is smaller than the old style, a smaller coring-knife is used; two sizes of the latter being furnished, one  $\frac{1}{4}$  inch and the other  $\frac{3}{8}$  inch, to suit the requirements of all.

#### **The Victor Wardrobe Hook.**

The accompanying illustration represents this article, which is made by the Van Wagoner & Williams Company, 82

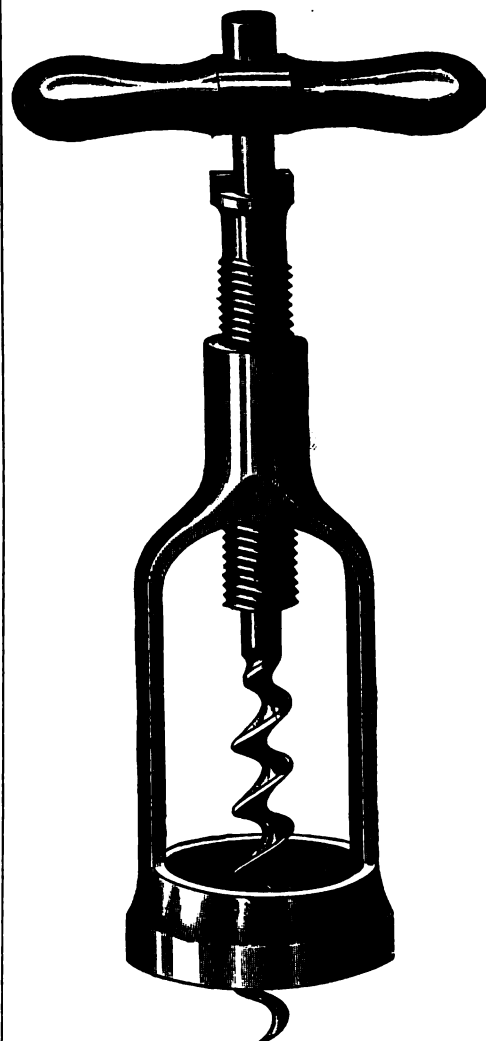


*The Victor Wardrobe Hook.*

Beekman street, New York. It is made, it will be observed, entirely of wire, the cut representing it full size. It is furnished coppered, japanned, tinned or in brass.

#### **Empire Automatic Cork Extractor.**

This article, patented April 16, 1889, is manufactured by the Empire Knife Company, West Winsted, Conn. Its form and



*Empire Automatic Cork Extractor.*

general construction are shown in the accompanying illustration. A spring in the head detaches the handle from the corkscrew rod, so that the corkscrew does not turn in the cork while pulling out, and the corkscrew can be set so as to turn any

distance into the cork, so that the cork need not be pierced through, thus saving it for use again. The power of this corkscrew is referred to as such that the hardest corks can be pulled with ease.

#### Elastic Hoop Wooden-Ware.

A line of goods manufactured by the Richmond Cedar Works, Richmond, Va., is illustrated in the accompanying cuts representing a pail and a tub with their elastic hoops. These goods are put on the market to meet the want of pails and



Fig. 1.—Elastic Hoop Pail.

tubs in which the hoops are not liable to get loose and the vessel to leak and fall apart. The elastic hoop is made of spring brass or spring steel and is run through corrugated rollers. Grooves are then cut around the buckets and the hoops are forced on and sprung into the grooves, each corrugation forming an independent spring, and the hoops expanding or contracting as the wood swells or shrinks. The hoops being elastic cannot break, and being in grooves

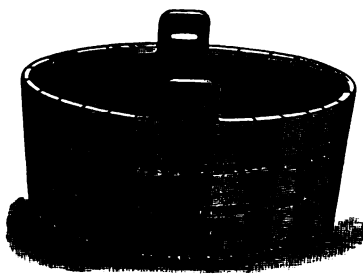


Fig. 2. Elastic Hoop Tub.

cannot fall off. This construction is referred to as giving a perfect vessel under all climatic or atmospheric conditions. The pails are made in white, red and striped cedar and highly polished, and the point is made that as there is no oil or other chemical put in this ware it is especially adapted for drinking and household purposes. The Richmond Cedar Works were recently awarded the medal of superiority at the Institute Fair, New York.

#### Paint Burner.

The National Sad Iron Company, St. Louis, Mo., are manufacturing a new paint burner, which is represented in the accompanying illustration. It works on



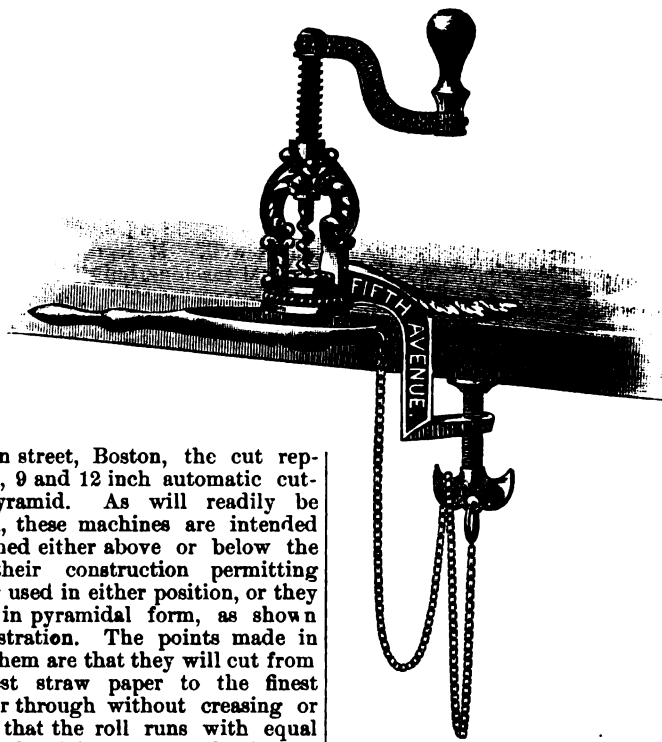
New Paint Burner.

the same principle as their well-known self-heating sad-iron. The advantages claimed for it are that it will make a hotter fire than other burners, is less trouble to handle and cannot explode.

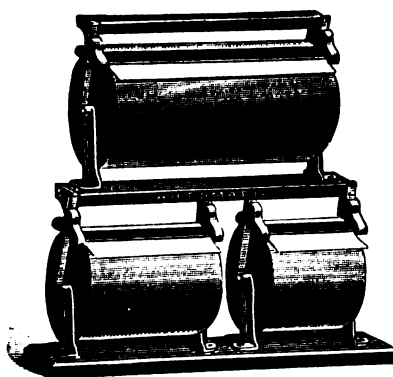
The fact that it does much quicker work than others is also alluded to. It will burn three hours with one filling.

#### Automatic Roll-Paper Holder and Cutter.

This contrivance, which is represented in the accompanying illustration, is put on the market by Charles O. Danforth, 114



Washington street, Boston, the cut representing 6, 9 and 12 inch automatic cutters in pyramid. As will readily be understood, these machines are intended to be attached either above or below the counter, their construction permitting their being used in either position, or they can be put in pyramidal form, as shown in the illustration. The points made in regard to them are that they will cut from the heaviest straw paper to the finest tissue-paper through without creasing or wrinkling; that the roll runs with equal facility whether full or empty, having no springs or heavy knives to tighten the paper, the cutter or knife dropping as the roll decreases; that the paper is easily ad-



Automatic Cutters in Pyramid.—6, 9 and 12 Inch.

justed, being put in from the front, thereby saving trouble in moving should the machine be fastened on the end of counter or against the wall, and that they are especially durable, having no springs, saws, heavy cumbersome knives or complicated movements to get out of order. They are made in sizes ranging from 6 to 36 inch and are made of iron, nicked or

size paper is required for a parcel and removes the sheets and scraps from the counter, saving much of the room usually occupied, thus giving an economy in time, paper and space.

#### Fifth Avenue Cork Extractor.

This article, shown in the illustration, is put on the market by James D. Frary, Meriden, Conn., and is, it will be seen, a

Fifth Avenue Cork Extractor.

wire stripper and cork remover combined. It will readily be understood that in use the extractor is clamped to a shelf or table as shown in the cut, and the point of screw is inserted in the cork, the handle being turned until the cork is extracted, even though the spring is pressed quite down. It is claimed that it draws the hardest cork every time. The handle connected by chain is for stripping the wires from the bottles and removing the cork from the screw after it is drawn, and by means of it the cork may be removed from the screw without touching it with the fingers. The thumb-screw is made of a suitable shape to hang on the handle when not in use. This cork extractor is neatly finished, and is referred to as meeting a want for a family corkscrew, especially for ladies' use. The ease with which it works and its attractive appearance are points in regard to it which are emphasized.

A large steel pipe is about to be laid from Pittsburgh to the natural gas field in Murfreesville, the first one used for a similar purpose. This pipe will be 34,000 feet long, and it takes 2000 tons of  $\frac{1}{4}$ -inch steel to manufacture it. Cast-iron pipe lines are composed of 12-foot sections, while the sections of this pipe will be 24 feet long. This fact explains why it is that a great deal of labor is saved, because it takes about as many men to lower a 24-foot section into a trench as it would take to place a 12-foot section. Each section is similar in appearance and construction to a boiler, and there is no doubt it will do as good service.

The United States gun-boat Petrel has had her dock trial at the Columbian Iron Works, Baltimore, and her engines and machinery worked admirably. No date has been set for the official trial trip.



## Nails from Tin-Scrap.\*

BY OBERLIN SMITH, BRIDGETON, N. J.

It may surprise the learned metallurgists who read this paper to learn that, by a recent discovery, nails of good quality can be made at one operation, directly from the ore, at the rate of, say, 60 per minute for each operator. It should be stated, however, that the raw material referred to does not answer strictly the ordinary assayer's definition of an ore. It is found, in strata of various thickness, in Harlem, N. Y., and other localities where the *débris* from restaurants and from sheet-metal factories of various kinds has been dumped. In other words, it is old and new tin-scrap—one of the few substances which this generation, mainly occupied in exhausting the accumulated resources of the past, seems to have laid up, by way of atonement, for the benefit of posterity. In speaking of this material as ore we are simply looking forward, prophetically, to the time when our descendants may dig it up and write learned papers for the American Institute of Mining Engineers upon the best methods of assaying and smelting it.

At least such has seemed to be its destiny hitherto. It may fairly be said that the many attempts which have been made to utilize it by separating, through chemical or electrolytical processes, its two valuable constituents, metallic tin and first-class wrought-iron, have failed, either technically or commercially. The reasons for such failure need not here be discussed. Either the separation has been incomplete, the iron still retaining enough tin to spoil it for the sinking-fire, or other use short of remelting (perhaps even for that), or the manipulations of the process have been too expensive to make its results profitable—or both. Meanwhile the great tin-scrap deposits have gone on growing faster than any other strata of our post-tertiary, psychical era; given up by metallurgists, not yet attacked by geologists, and explored only by that mining engineer of the transitional period, Gulielmus Caper.

Before leaving these heaps of tin-scrap, however, to become mere mineral deposits for future ages, it may be well to consider a novel plan for their immediate utilization—novel not only in its means, but in its principle. For it undertakes to use this material just as it is, without trying to separate its constituents at all, and to use it, moreover, for a purpose in which the qualities of both these constituents—namely, the tensile strength and ductility of the iron and the resistance of the tin to corrosion—are directly employed with advantage. I refer to the manufacture, by mechanical pressure, of nails.

This nail was invented, in its original shape, by Mr. George H. Perkins, of Philadelphia, and has been developed, through various forms, until it has almost reached a commercial stage—the machine in which it is to be made in marketable shape being nearly completed. The writer has been associated with Mr. Perkins in its development, and can, perhaps, make interesting a brief description of the troubles we have gone through in order to produce it quickly, at one operation, in a reasonably manageable and durable machine. The first scheme tried was to cut "blanks" from ordinary tin-plate and sheet-iron scrap, of an approximately rectangular form, about  $\frac{1}{4}$  inch wide by  $1\frac{1}{4}$  inches long. This was done in an ordinary press. By a second operation it was corrugated in another press, with a special automatic die, which corrugated the middle grooves first and the side grooves afterward, much of the metal used not proving strong enough to stand the friction of being pulled into the corru-

gations of the die without cracking. At a third operation the embryo nail was crushed together, something after the manner of closing an accordion bellows. These headless nails were then fed by hand into a revolving dial, to carry them under a heading mechanism, after the operation of which they were ejected from the machine automatically.

Obviously, this series of separate operations made the nails far too expensive for the market, and, moreover, some trouble occurred from their splitting in the tightly-folded corrugations. We afterward built an automatic machine which performed all the above operations in succession, delivering a complete nail at each stroke. It was, however, far too complicated for practical use, and simply served to show what could not be done.

Our second nail-machine proper, constructed to receive blanks which had been already cut in an ordinary press, worked fairly well. It was likewise an experimental machine, built "piece-meal" and not strong enough for continual hard work, but it served this time to show what could be done. Instead of working upon the principle of regular corrugations it simply crushed up the blanks edgewise into any form which they chose to assume. The machine now under construction has been very much simplified and made enormously strong and heavy. It is adapted to cutting, crushing, gripping and heading the nails at one operation, and can be run as fast as an expert operator can feed the material. Its feed probably varies, with jagged, irregular scrap, from 30 to 90 nails per minute, although straight strips of sheet metal can easily be fed by hand into a machine running as high as 240 strokes per minute. During the course of our experiments various forms of nails have been tried. Among others were straight cylindrical nails with conical points; straight square nails with pyramidal and with wedge-shaped points; hexagonal nails, &c. The most practical form seems to be the square taper nail with about the same shape as the ordinary cut nail, but is somewhat stronger and a good deal tougher. It is well adapted for all ordinary purposes, but is especially suitable for a roofing nail, since the tin coating prevents much rusting and is good to solder to.

Among other processes we have tried winding the nail blank upon itself, after the manner of a window shade, but minus a mandrel. This, however, was difficult in execution, and was not found available in practice. The economy of this system of nail-making is obvious. The scrap can be bought for about 17 cents per 100 pounds, and a boy can make perhaps 100 pounds of nails per day. The most economical system of manufacture will probably be to run one or more nail machines at each large "tinshop," set as close as possible to the presses which produce the scrap, so as to avoid the expense of unnecessary handling and the extra tangling-up incident thereto.

Secretary Tracy has determined to give coil steam boilers a practical trial to test their value for use in large naval vessels. Secretary Whitney took the preliminary steps toward such a trial, and some manufacturers built boilers for the trial, but as the end of the Administration was drawing near the project was dropped. Coil boilers have proved very successful in small boats, but they have not yet passed the experimental state in large vessels, although the French Government has placed them in a number of war ships. Part of the steam-power for the armored coast-defense vessels is to be generated by this type of boiler. It will be a long time, however, before the boilers of the coast-defense vessel are tested, and in the mean-

time it is proposed to give these boilers a thorough test on land. The special advantages they possess over the old type of marine boilers are in economy of weight and space, two very important factors in the construction of a modern naval vessel.

The Cragin Mfg. Company, of Chicago, made a voluntary assignment to William A. Montgomery on the 1st inst. The assignee states that the liabilities are about \$70,000 and the assets from \$180,000 to \$150,000. The company had some paper overdue, and though none of the creditors were pressing their claims for payment, it was thought best to go into liquidation rather than to struggle along and perhaps dissipate the assets. They own a well-appointed factory at Cragin, in the vicinity of Chicago, and have been manufacturing sheet-iron ware, possessing valuable patents on machinery for the manufacture of coal-hods, dripping-pans, &c. The works were established by Cragin Bros. & Chandler. In 1888 the Cragin Mfg. Company were organized with a capital of \$120,000. The stock was mainly owned by the president, W. P. Cragin, and the Dudley Estate. It is expected that a considerable sum will be realized for the stockholders after all the claims against the company have been fully paid.

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\*Read at the New York Meeting of the American Institute of Mining Engineers.



# CURRENT HARDWARE PRICES.

MAY 8, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

### Caps, Percussion, 7 1000—

Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmed Edge, 1-10's.....	25¢
E. B. Grnd. Edge, Cent. Fire, 25¢	
1-10's, 70¢	74¢
Double Waterproof, 1-10's.....	\$1.40
Musket Waterproof, 1-10's.....	50¢
G. D. ....	25¢
S. B. ....	30¢

### Union Metallic Cartridge Co.

F. C. Trimm'd.....	50¢
F. L. Ground.....	65¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof.....	74¢
Dbl. Waterproof, in 1-10's.....	\$1.40
S. B. Genuine Imp. 1-10's.....	45¢
Eley's E. B. ....	54¢
Eley's D. Waterproof, Central Fire.....	\$1.60

### Cartridges.

Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire, Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., \$1.75.....	2¢
Blank Cartridges, 32 cal., \$3.50.....	2¢
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball, \$1.75.....	2¢
B. B. Caps, Con. Ball, Swgd., \$2.00.....	2¢

### Primers.

Berdan Primers, \$1.00.....	2¢
B. L. Caps (for Sturtevant Shells) \$1.00.....	2¢
All other Primers, \$1.20.....	2¢

### Shells.

First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (\$1.10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	39¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Seibold's Comb. Shot Shells.....	15¢
Brass Shot Shells, first quality.....	50¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L., 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	\$3.25

### Shells Loaded—

A. M. Co. List No. 19, 1887.....	20¢
Wade—	
U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.90
U. M. C. & W. R. A.—B. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 7&8.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.90
Eley's B. E., 11 up.....	\$1.75
Eley's P. E., 11 up.....	\$2.80

### Anvils.—

Eagle Anvils, 7 10¢.....	20¢
Peter Wright's.....	94¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra 11½.....	\$1.11
Trenton.....	94¢
Wilkinson's.....	94¢
J. & Riley Carr, 10½.....	\$1.11
Moore & Barnes Mfg. Co.....	83¢

### Anvil Vise and Drill—

Millers Falls Co., \$18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, \$3.00.....	40¢

### Apple Parers—

Advance.....	7¢
Antrim Combination.....	5¢
Baldwin.....	5¢
Champion.....	7¢
Eureka, 1888.....	17¢
Family Bay State.....	12¢
Gem.....	5¢
Gold Medal.....	4¢
Hudson's New '88.....	3¢
Ideal.....	4¢
Improved Bay State.....	30¢
Little Star.....	5¢
Monarch.....	13¢
New Lightning.....	5¢
Orion.....	4¢
Penn.....	4¢
Perfection.....	4¢
Pomona.....	4¢
Rocking Table.....	6¢
Turntable.....	4¢
Victor.....	13¢
Waverly.....	4¢
White Mountain.....	4¢
72.....	4¢
76.....	5¢
78.....	6¢

### Augers and Bits—

Douglas Mfg. Co.....	
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	55¢
Cook's, Douglas Mfg. Co.....	50¢
Cook's, N. H. Copper Mfg. Co.....	50¢
Ives' Circular Lip.....	60¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension lip.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 7 set, 32½ quaters, No. 5, 85; No. 30, \$3.50.....	25¢
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	20¢
Car Bits.....	50¢
L. Hommedieu Car Bits.....	15¢
Forstner Pat. Auger Bits.....	10¢

## Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas.....	25¢
Bonney's Adjustable, 7 doz \$48.....	40¢
Stearns'.....	20¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

## Expansive Bits—

Clarks' small, \$18; large, \$26.....	35¢
Ives' No. 4, 7 doz \$60.....	40¢
Swan's.....	40¢
Stearns' No. 1, \$22; No. 2, \$22.....	35¢
Stearns' No. 2, \$48.....	20¢

## Gimlet Bits—

Common.....	7¢
Diamond.....	25¢
Bee.....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Cl. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 7 gr.....	35¢
Double Cut, Douglas.....	40¢
Double Cut, Ives.....	60¢

## Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢
Williams' or Holt's, for wood.....	40¢

## Ship Augers and Bits—

L. Hommedieu's.....	15¢
Watrous.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

## Awl Haste—

Sewing, Brass Fer. 7 gr.....	\$3.50
Pat. Sewing, Short, \$1.00 7 gr.....	40¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top, 7 gr.....	\$10.00
Pat. Peg, Leather Top, 7 gr.....	\$12.00

## Awls, Brad Sets, &c—

Awls, Sewing, Common 7 gr.....	\$1.70
Awls, Should. Fer. 7 gr.....	\$2.45
Awls, Pat. Peg.....	65¢
Awls, Shouldered Brad, 2.70 7 gr.....	35¢
Awls, Handled Brad.....	\$7.50
Awls, Handled Scratch 7 gr.....	\$7.50
Awls, Socket Scratch, 7 doz.....	\$1.50

## Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	
No. 20, 7 doz \$10.00.....	55¢
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$8.....	25¢
Miller's Falls Adj. Tool Hds.....	25¢
Nos. 1, \$12; 2, \$18.....	25¢
Henry's Combination Hart.....	70¢
Brad Sets.....	
No. 42, \$10.50; No. 43, \$12.50.....	70¢
Stanley's Excelsior.....	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢

## Axes—

First quality.....	7¢
Others.....	5¢

## Makers' and Special Brands—

Fraser's.....	7¢
Dixon's Everlasting, in boxes.....	10¢
Dixon's Everlasting.....	10¢
Lower grades, special brands.....	7¢

## Axles—

No. 1.....	4¢
Nos. 7 to 14.....	55¢
Nos. 15 to 18.....	47¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	33¢
Over 10 sets.....	33¢

## Bag Holders.—

Springle's Pat.....	7¢
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## Balances—

Spring Balances.....	50¢
Common 24 lb.....	\$1.50
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells—

Hand—	
Light Brass.....	70¢
White Metal.....	60¢
Silver Chime.....	35¢
Globe (Cone's Patent).....	25¢

## Door—

Gong, Abbe's.....	35¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	net
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co.'s.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

## Common Wrought—

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	20¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	7¢
Steel Alloy Church and School Bells.....	40¢

## Belows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Belows.....	40¢

## Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

## Bench Steps—

Morrill's.....	7¢
Hotchkiss's.....	10¢
Weston's, No. 1, \$10; No. 2, \$9.25.....	10¢
McGill's.....	7¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension.....	7¢
Barber's.....	40¢
Ives.....	40¢
Diagonal.....	40¢
Angular.....	40¢

## Blind Adjusters—

Domestic.....	7¢
Excelsior.....	10¢
Washburn's Self-Locking.....	20¢

## Blind Fasteners—

Macrell's.....	20¢
Van Sand's Screw Pat.....	15¢
Van Sand's Old Pat.....	15¢
Washburn's Old Pattern, 7 gr.....	30¢
Merriman's.....	new list
Austin & Eddy No. 2008, 7 gr.....	30¢
Security Gravity, 7 gr.....	30¢

## Blind Staples—

Barbed, 1/4 in. and larger.....	7¢
Barbed, 3/4 in.....	8¢

## Blocks—

Ordinary Tackle, list revised May 1, 1889.....	50¢
Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

## Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

## Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct., '84.....	75¢
Phila. pattern, list Oct. 7, '84.....	75¢
R. B. & W., old list.....	75¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

## Tire—

Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company.....	70¢
Empire, list Feb. 28, '83.....	70¢
Keystone, Philadel., list Oct. '84.....	82¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company.....	
Norway, Phila., list Oct. 16, '84.....	75¢
Eagle, Phila., list Oct. 16, '84.....	80¢
Philadel., list Oct. 16, '84.....	82¢
Bay State, list Feb. 28, '83.....	70¢
R. B. & W., Philadel., list Oct. 16, '84.....	82¢

## Stove and Plow—

Stove.....	65¢
Plow.....	60¢
R. B. & W., Plow.....	55¢

## Boring Machines—

Without Augers. Upright. Angular.....	
Douglas.....	\$5.50
Snell's, Rice's Pat. 5.50 6.75.....	50¢
Jennings.....	5.50
Other Machines.....	2.35
Phillips' Patent.....	7.00
With Augers.....	7.50

## Bow Pins—

Humason, Beckley & Co.'s.....	60¢
Sargent & Co.'s.....	\$1.17
Peck, Stow & W. Co.....	50¢

## Braces—

Barber's.....	
Nos. 10 to 16.....	50¢
Nos. 30 to 33.....	50¢
Nos. 40 to 63.....	60¢
Barker's.....	
Nos. 8, 10 and 12.....	75¢
Plated, Nos. 8, 10 and 12.....	65¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barbers.....	60¢
Spofford.....	60¢
Common Ball, American.....	\$1.10
Bartholomew's.....	
Nos. 25, 27 and 30.....	50¢
Nos. 117, 118, 119.....	70¢

## Amidon's

Spoford.....	60¢±	60¢±10
Common Ball, American.....	\$1.10±	\$1.15±
Gartholomew's.....		
Nos. 25, 27 and 30.....	50±10	60±5±
Nos. 117, 118, 119.....	70±	70±5±
Amidon's.....		
Barker's Imp'd Plain.....	75±10	80±
Barker's Imp. Nickeled.....	65±10	70±
Ratchet.....	75±10	80±
Eclipse Ratchet.....		60±
Globe Jawed.....	40±	40±10±
Corner Brace.....	40±	40±10±
Universal, 8 in., \$2.10; 10 in.....		\$2.25
Buffalo Ball.....	\$1.10±	\$1.15±
P. S. & W.....		60±10±

### Freezers, Ice Cream—

**Freezers, Ice Cream—**

Champion	60¢10&10
Shepard's Lightning	85¢ @ 65&5
White Mountain	50¢20&5
New Arctic	50¢40&5
American	60¢
Blizzard	65¢
Double Action Crown	70¢
Crown	60¢
Star	60¢
Peerless and Giant	60&10
Zee and Pet	60&10
Boas	65&10&10

**Fruit and Jelly Presses—**

Enterprise Mfg. Co.	80&10&30
Hens	50¢ \$ dos \$3.75 @ \$4.50
P. D. & Co.	50¢ \$ dos \$5.75 @ 10
Shepard's Queen City	40¢

**Fry Pans—**

High List	75&5 @ 75&10
No. 0	1 2 3 4
5	6 7 8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
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95	96
97	98
99	100

**Fuse—** \$ 1000 ft

Common Hemp Fuse, for dry ground \$2.70  
Common Cotton Fuse, for dry ground 2.85  
Small Taped Fuse, for wet ground 1.35  
Double Taped Fuse, for wet wet gr. 5.40  
Triple Taped Fuse, for very wet gr. 6.50  
Small Gutta Percha Fuse, for water 7.50  
Large Gutta Percha Fuse, for water 12.00

**Gauges—**

Marking, Mortise, &c.	60&10
Starrett's Surface, Center and Scratch	25&10
Wire, low list	10&10
Wire, Wheel, Madden & Co.	10
Wire, Morse's	50&5&5
Wire, Brown & Sharpe's	10&30

**Glimties—**

Nail and Spike	50&10&5
"Eureka" Glimties	40&10
"Diamond" Glimties	50¢ gr \$5.00
Double Cut, Shepardson's	25&5&5
Double Cut, Ives	60¢
Double Cut, Douglass	40&10
"Bee," 5 gr \$12	25¢ @ 25&5

**Glue—**

Le Page's Liquid	35¢ @ 25&5
Upson's Liquid	35¢
Le Page & Co.'s Improved Process	25¢ @ 25&5

**Glue Pots—**

Tinned	40¢
Enameled	40&5
Family, Howe's "Eureka"	40¢
Family, L. F. C.'s "Handy"	50¢

**Grindstones—**

Small, at factory ..... \$ ton \$7.50 @ 9.00

**Grindstone Fixtures—**

Sargent's Patent	70&10
Reading Hardware Co.	80&10

**Hack Saws.—**

See Saws.

**Halters—**

Covett's, Rope, 1/4-in. Jute	50&2
Covett's, Rope, 3/4-in. Hemp	40&2
Covett's Adj. Rope Halters	40&2
Covett's Hemp Horse and Cattle Tie	50&2
Covett's Jute Horse and Cattle Tie	60&10&2

**Hammers—**

*Handled Hammers—*

Maydole's, list Dec. 1, '85	25¢ @ 25&10
Huyton & Beekley	30¢
Huyton & Beekley	30¢
Atha Tool Co.	50¢ @ 50&10
Fayette R. Plumb	40&10 @ 50¢
C. Hammond & Son	40&10 @ 50¢
Verree	5¢
Magnetic Tool, Nos. 1, 2, 3, \$1.25, 1.50 &	1.50 &
Nelson Tool Works	40&10
Warner & Nobles	30&25
Peck, Stow & Wilcox	40¢
Sargent's	38 1/2 @ 10

*Heavy Hammers and Sedges—*

3 lb and under	40¢
3 lb 5 lb	40¢
Over 5 lb	40¢
Wilkinson's Smiths	10¢ @ 11 1/2 @ 12 1/2

**Handcuffs and Leg Irons—**

R. I. Tool Co., Handcuffs, \$15.00, 50¢ dos 10¢	10¢
R. I. Tool Co., Leg Irons, \$25.00, 50¢ dos 10¢	10¢
Tower's	10¢
Polished, 50¢ dos \$48.00; Nickleplated, \$57.00; 3 Hands, Polished, 50¢ dos \$72.00; Nickleplated, \$84.00.	25¢

**Handles—**

*Iron, Wrought or Cast—*

Door or Thumb	1 2 3 4
Nos.	1 2 3 4
Per doz.	\$0.90 1.00 1.18 1.35 1.50

*Roggin's Latches*

Roggin's Latches	60&10&10
Bronze Iron Drop Latches	50¢ dos 70¢ net
Jap'd Store Door Handles—Nuts, \$1.62;	
Plate, \$1.10; no Plate, \$0.88	net
Barn Door, 30¢ dos \$1.40	10&10
Chest and Lifting	70¢

*Handles, Wood—*

Saw and Plane	40&10 @ 40&10&5
Hammer, Hatchet, Axe, Sledge, &c.	40¢
Bradawl	50¢
Hickory Firmer Chisel, ass'd.	50¢ gr \$2.00
Hickory Firmer Chisel, large	50¢ gr \$2.00
Apple Firmer Chisel, ass'd.	50¢ gr \$2.00
Apple Firmer Chisel, large	50¢ gr \$2.00
Socket Firmer Chisel, ass'd.	50¢ gr \$2.00
Socket Framing Chisel, ass'd.	50¢ gr \$2.00
J. S. Smith & Co.'s Pat File	50¢
File, assorted	50¢ gr \$2.75
Auger, large	50¢ gr \$2.00
Pat. Auger, Ives	50¢ gr \$2.00
Pat. Auger, Douglass	50¢ gr \$2.00
Pat. Auger, Swan	50¢ gr \$2.00
Hoe Rake Shovels &c.	50&10

**Cross-Cut Saw Handles—**  
 Atkins' No. 1 Loop, # pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.  
 Boynton's Loop Saw Handles, 50¢. 60¢  
 Champion.....10¢

**Hangers—**  
 Barn Door, old patterns.....60¢10¢10¢70¢  
 Barn Door, New England.....60¢10¢10¢70¢  
 Samson Steel Anti-Friction.....55¢  
 Orleans Steel.....55¢  
 Hamilton Wrought Wood Track.....55¢  
 U. S. Wood Track.....55¢  
 Champion.....60¢10¢  
 Rider and Wooster, Medina Yfg. Co.'s list.....70¢  
 Climax Anti-Friction.....60¢  
 Climax Anti-Friction for Wood Track.....55¢  
 Zenith for Wood Track.....55¢  
 Reed's Steel Arm.....50¢  
 Challenge, Barn Door.....50¢  
 Sterling's Imp'vd (Anti-Friction) 65¢10¢  
 Victor, No. 1, \$15.00; No. 2, \$15.50; No. 3, \$18.00.....50¢25¢  
 Cheritree.....50¢10¢  
 Kidder's.....50¢10¢  
 The Boss.....60¢10¢  
 Best Anti-Friction.....60¢10¢  
 Duplex (Wood Track).....60¢10¢5¢  
 Terry's Pat., # doz pr. 4 in, \$10.00; 5 in, \$12.00.....50¢25¢50¢10¢  
 Cronk's Pat., No. 4, \$12.00; No. 6, \$14.50; No. 8, \$16.00.....50¢15¢60¢  
 Wood Track Iron Clad, # ft. 10'.....50¢  
 Carrier Steel Anti-Friction.....50¢50¢5¢  
 Architect, # set \$6.00.....20¢  
 Ellipse.....20¢10¢  
 Felix, # set \$4.50.....20¢  
 Richards.....30¢30¢10¢  
 Lane's Steel.....40¢10¢  
 Ball Bearing Door Hanger.....20¢10¢10¢  
 Warner's Pat.....20¢10¢10¢  
 Stearns' Anti-Friction.....25¢10¢25¢10¢10¢  
 Stearns' Challenge.....40¢10¢5¢  
 Faultless.....40¢  
 American, # set \$5.00.....40¢  
 Rider & Wooster, No. 1, 62¢; No. 2, 75¢  
 Paragon, Nos. 1, 2 and 3.....40¢10¢  
 Paragon, Nos. 5, 5½, 7 and 8.....20¢10¢  
 Crescent.....60¢10¢10¢  
 Nickel, Cast Iron.....50¢  
 Nickel, Malleable Iron and Steel.....40¢  
 Soranton Anti-Friction Single Strap.....40¢  
 Soranton Anti-Friction Double Strap.....40¢  
 Universal Anti-Friction.....40¢  
 Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....45¢  
 Star.....40¢10¢40¢10¢5¢  
 May.....50¢5¢50¢10¢  
 Barry, \$6.00.....40¢10¢

**Harness Snaps—**  
 See Snaps.  
**Hatchets—**  
 List Jan. 1, 1888.....35¢40¢  
 Isalah Blood.....40¢5¢  
 Hunt's Shingling, Lath and Claw.....40¢5¢  
 Hunt's Broad.....40¢10¢5¢  
 Buffalo Hammer Co.....40¢10¢5¢  
 Hurd's.....40¢10¢5¢  
 Fayette R. Plumb.....40¢10¢5¢  
 Wm. Mann, Jr., & Co.....50¢50¢5¢  
 Underhill Edge Tool Co.....40¢50¢10¢  
 Underhill's, Haines and Bright.....35¢4¢  
 C. Hammond & Son.....40¢10¢5¢  
 Shumans.....40¢10¢5¢  
 Peck's.....40¢10¢5¢  
 Kelly's.....50¢50¢5¢  
 Sargent & Co.....50¢  
 Ten Eyck Edge Tool Co.....40¢10¢40¢10¢5¢  
 Collins.....10¢  
 Schulte, Lohoff & Co.....50¢50¢5¢

**Hay and Straw Knives—**  
 Lightning, Mfrs. price \$18.00, 25¢  
 But jobbers frequently give extras.  
 Gem.....40¢10¢  
 Wadsworth's.....40¢7¢40¢10¢  
 Carter's Needle.....# doz \$11.50¢12.00  
 Heath's.....# doz \$13.50¢14.00  
 Auburn Hay, Com. and Spear Point.....50¢  
 Auburn, Straw.....40¢  
 Nollin's Hay.....# doz \$10.00

**Hinges—**  
**Wrought Iron Hinges**  
 Strap and T.....75¢5¢75¢10¢  
 Screw Hook and Strap.....14 to 20 in., # doz 3¢; 22 to 36 in., # doz 2¢; 36 to 48 in., # doz 1¢  
 Heavy Welded.....6 to 12 in., # doz 3¢; 14 to 20 in., # doz 8¢; 22 to 36 in., # doz 2¢; 36 to 48 in., # doz 1¢  
 Hook.....14 to 20 in., # doz \$1.50; 22 to 36 in., # doz \$2.45; 36 to 48 in., # doz \$3.80  
 Rolled Blind Hinges, Nos. 33 and 34.....50¢10¢  
 Rolled Blind Hinges, Nos. 332 and 334.....50¢10¢  
 Rolled Plate.....70¢10¢  
 Rolled Raised.....70¢10¢  
 Plate Hinges (8, 10 & 12 in., # doz 4¢; "Providence" over 12 in., # doz 4¢)  
**Spring Hinges—**  
 Gear's Spring and Blank Butts.....40¢  
 Union Spring Hinge Co.'s list, March, 1888.....30¢  
 Acme and U. S.....30¢  
 Empire and Crown.....30¢  
 Hero and Monarch.....50¢  
 American, Gem, and Star, Japanized.....20¢  
 American, Gem, and Star, Bronzed.....net  
 Oxford, Bronze and Brass.....net  
 Barker's Double Acting.....20¢10¢  
 Union Mfg. Co.....25¢  
 Bommer's.....30¢  
 Buckman's.....15¢20¢  
 Chicago.....30¢  
 Wiles.....10¢  
 Devore's.....40¢  
 Rex.....40¢  
 Royal.....60¢  
 Reliable.....60¢  
 Champion.....60¢  
**Gate Hinges—**  
 Western.....# doz \$4.40, 60¢  
 N. E.....# doz \$7.00, 55¢  
 N. E. Reversible.....# doz \$6.20, 55¢10¢  
 Clark's, Nos. 1, 2, 3.....# doz \$5.00, 55¢10¢  
 Automatic.....# doz \$12.50, 50¢  
 Common Sense.....# doz pair \$4.50, 60¢  
 Seymour's.....45¢10¢  
 Shepard's.....60¢10¢5¢  
 Reed's Latch and Hinges.....# doz \$12.00, 50¢

**Blind Hinges—**  
 Parker.....75¢2¢  
 Palmer.....50¢5¢10¢  
 Seymour.....70¢2¢  
 Nicholson.....45¢10¢  
 Huffer.....50¢

**Clark's, Nos. 1, 3, 5, 40 and 50**  
 Clark's Mortise Gravity.....75¢10¢5¢80¢  
 Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢55¢10¢5¢  
 Sargent's, No. 12.....77¢10¢10¢  
 Reading's Gravity.....75¢10¢75¢10¢5¢  
 Shepard's.....75¢10¢5¢  
 Noiseless.....80¢2¢4¢  
 Niagara.....80¢2¢4¢  
 Buffalo.....80¢2¢4¢  
 Clark's Genuine Pat.....80¢2¢4¢  
 O. S., Lull & Porter.....75¢10¢  
 Acme, Lull & Porter.....75¢10¢  
 Queen City Reversible.....70¢  
 Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75¢10¢5¢  
 North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....25¢2¢

**Hoes—**  
**Handled—**  
 Garden, Mortar, &c.....65¢  
 Planter's, Cotton, &c.....65¢  
 Warren Hoe.....60¢  
 Magic.....# doz \$4.00  
**Eye—**  
 D. & H. Scovill.....20¢  
 Lane's Crescent Planter's Pattern.....45¢5¢  
 Lane's Razor Blade, Scovill Pattern.....30¢  
 Maynard, S. & O. Pat.....45¢5¢  
 Sandusky Tool Co., S. & O. Pat.....60¢  
 Hubbard & Co., S. & O. Pat.....60¢  
 Chastanoga Tool Co., S. & O. Pat.....60¢  
 Grub.....60¢60¢10¢  
**Hog Rings and Ringers—**  
 Hill's Improved Ringers.....# doz \$4.25  
 Hill's Old Style Ringers.....# doz \$4.50  
 Hill's Tongue.....# doz \$4.50  
 Hill's Rings.....# doz bxs \$2.15¢2.25  
 Perfect Rings.....# doz bxs \$1.60¢1.70  
 Blair's Hog Ringers.....# doz \$2.25¢2.50  
 Blair's Hog Ringers.....# doz \$0.90¢1.00  
 Champion Ringers.....# doz \$2.00  
 Champion Kings, Double.....# doz \$2.25  
 Brown's Ringers.....# doz \$2.00  
 Brown's Rings.....# doz \$1.25¢1.30  
**Hoisting Apparatus—**  
 Moore's Hand Hoist, with Lock.....20¢  
 Moore's Differential Pulley Block.....40¢  
 Energy Mfg. Co.'s.....25¢  
**Holders, File and Tool—**  
 Bals Pat.....# doz \$4.00, 25¢  
 Nicholson File Holders.....20¢  
**Hollow-Ware—**  
**Iron—**  
 Stove Hollow-Ware—  
 Ground.....60¢60¢5¢  
 Unground.....60¢10¢60¢10¢10¢  
 Enameled Hollow-Ware—  
 Maslin Kettles.....65¢10¢  
 Boilers and Saucepans.....40¢5¢  
 Tinned Boilers and Saucepans.....40¢  
 Gray Enameled Ware—  
 Stove.....50¢50¢5¢  
 Maslin Kettles.....60¢10¢60¢10¢10¢  
 Boilers and Saucepans.....40¢5¢  
 Agate and Granite Ware, list Jan. 1, 1889.....35¢4¢10¢  
 Rustless Hollow-Ware.....50¢50¢5¢  
 Galvanized Tea-Kettles—  
 Inch.....6 7 8 9  
 Each.....55¢ 60¢ 65¢ 75¢  
**Silver Plated—**  
 4 mo. or 5 ¢ cash in 30 days.  
 Reed & Barton.....40¢5¢  
 Meriden Britannia Co.....40¢5¢  
 Simpson, Hall, Miller & Co.....40¢5¢  
 Rogers & Brother.....40¢5¢5¢  
 Hartford Silver Plate Co.....40¢5¢5¢  
 William Rogers Mfg. Co.....40¢5¢5¢  
**Hooks—**  
**Cast Iron—**  
 Bird Cage, Sargent's list.....60¢10¢10¢  
 Bird Cage, Reading.....60¢10¢10¢  
 Clothes Line, Sargent's list.....60¢10¢10¢  
 Clothes Line, Reading list.....60¢10¢10¢  
 Ceiling, Sargent's list.....55¢10¢10¢  
 Harness, Reading list.....55¢10¢10¢  
 Coat and Hat, Sargent's list.....55¢10¢10¢  
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢  
**Wrought Iron—**  
 Cotton.....# doz \$1.25  
 Cotton Pat. (N.Y. Mallet & Handle Wks.).....30¢  
 Tassel and Picture (T. & S. Mfg. Co.).....50¢  
 Wrought Staples, Hooks, &c.....See Wrought Goods.  
**Wire—**  
 Wire Coat and Hat, Gem, list April, 1888.....45¢  
 Wire Coat and Hat, Miles', list April, 1888.....45¢  
 Indestructible Coat and Hat.....45¢  
 Wire Coat and Hat, Standard.....45¢  
 Belt.....75¢10¢80¢  
**Miscellaneous—**  
 Grass, No. 2, \$3.00; No. 3, \$2.25; No. 4, \$2.50  
 Nollin's Grass.....# doz \$2.25  
 Bush.....55¢00¢  
 Whiffetree—Patent.....55¢  
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢  
 Hooks and Eyes—Brass.....60¢10¢10¢  
 Fish Hooks, American.....50¢  
 Bench Hooks.....See Bench Stops.  
**Horse Nails—**  
 Nos. 6 7 8 9 10  
 Ausable.....28¢ 26¢ 25¢ 24¢ 23¢  
 Clinton, Pin.....24¢ 22¢ 21¢ 20¢ 19¢  
 Essex.....25¢ 26¢ 25¢ 24¢ 23¢  
 Lyra.....25¢ 23¢ 22¢ 21¢ 20¢  
 Snowden.....25¢ 23¢ 22¢ 21¢ 20¢  
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢  
 1000 lb in year 15¢  
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢  
 Northwest.....25¢ 23¢ 22¢ 21¢ 20¢  
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢  
 Boston.....23¢ 21¢ 20¢ 19¢ 18¢  
 A. C.....25¢ 23¢ 22¢ 21¢ 20¢  
 C. B. K.....25¢ 23¢ 22¢ 21¢ 20¢  
 Champlain.....28¢ 26¢ 25¢ 24¢ 23¢

25¢10¢10¢

**New Haven.....28¢ 26¢ 25¢ 24¢ 23¢**  
 Saranac.....23¢ 21¢ 20¢ 19¢ 18¢  
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢  
 Capewell.....23¢ 21¢ 20¢ 19¢ 18¢  
 Star.....23¢ 21¢ 20¢ 19¢ 18¢  
 Anchor.....23¢ 21¢ 20¢ 19¢ 18¢  
 Western.....23¢ 21¢ 20¢ 19¢ 18¢  
 Empire Bronzed.....14 ¢ d.  
**Horse Shoes—See Shoes Horse.**

**Hose, Rubber—**  
 Competition.....75¢10¢75¢10¢5¢  
 Standard.....70¢70¢10¢  
 Extra.....60¢60¢10¢  
 N. Y. B. & P. Co., Para.....30¢10¢  
 N. Y. B. & P. Co., Extra.....50¢  
 N. Y. B. & P. Co., Dundee.....60¢10¢5¢

**Hunkers—**  
 Blair's Adjustable.....# gr \$8.00  
 Blair's Adjustable Clipper.....# gr 7.00

**Indurated Fiber-Ware.**  
 Spittoons, No. 2, # doz.....\$6.75  
 Basins, Ringed, # doz., No. 1, \$3.70; No. 2, \$3.10; No. 3.....\$2.70  
 Washbasins, Nested, Nos. 0, 1, 2 and 3 (pieces), # doz nests.....\$16.87  
 Keelers, Nested, Nos. 1, 2, 3 and 4 (pieces), # doz nests.....\$8.37  
 Butter Bowls 15, 17 and 19-inch (3 pieces), # doz nests.....\$6.75  
 Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), # set.....\$3.00  
 Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), # set.....\$2.25  
 See also Patls.

**Jack Screws—See Screws.**

**Kettles—**  
 Spun. Stamped.  
 Brass, 7 to 17 in., # doz.....24¢ 21¢  
 Brass larger than 17 in.....26¢ 23¢4¢  
 Enameled and Tea Kettles.....See Hollow-Ware.

**Keys—**  
 Lock Ass'n list Dec. 30, 1888.....50¢10¢  
 Eagle, Cabinet, &c.....60¢5¢  
 Hotchkiss' Brass Blanks.....40¢  
 Hotchkiss, Copper and Tinned.....30¢  
 Hotchkiss, Pad and Cab.....30¢  
 Ratchet Bed Key.....# doz \$4.00, 15¢  
 Wollensak Tinned.....50¢10¢

**Knife Sharpeners—**  
 Parkin's.....# doz \$6.00, 40¢  
 Rosewood or Cocobolo.....# doz \$6.00, 40¢

**Knives—**  
 Wilson's Butcher Knives.....25¢30¢  
 Ames' Butcher Knives.....25¢  
 Foster Bros' Butcher.....40¢  
 Nichols' Butcher Knives.....40¢10¢  
 Ames' Shoe Knives.....20¢25¢  
 Ames' Bread Knives.....# doz \$1.50, 15¢20¢  
 Moran's Shoe and Bread.....20¢  
 Hay and Straw.....See Hay Knives.  
 Table and Pocket.....See Cutlery.  
 Corn, Auburn Mfg. Co. Western Pat.....\$3.50  
 Corn, Auburn Mfg. Co. Crescent.....\$3.50

**Knobs—**  
 Door Mineral.....55¢68¢  
 Door Por. Jap'd.....75¢78¢  
 Door Por. Nickel.....\$2.00¢2.25  
 Door Por. Plated.....\$2.00¢2.25  
 Door Por. Plain.....60¢10¢60¢10¢10¢  
 Hemacite Door Knobs.....40¢10¢50¢  
 Yale & Towne Wood, list Dec., 1888.....40¢  
 Furniture Plain.....75¢ gro 10¢ 10¢  
 Furniture Wood Screws.....25¢10¢  
 Base, Rubber Tip.....70¢10¢5¢  
 Picture, Judd's.....60¢10¢10¢  
 Picture, Sargent's.....70¢10¢  
 Picture, Hemacite.....35¢5¢  
 Shutter, Porcelain.....65¢10¢  
 Carriage, Jap.....# gro 80¢, 60¢10¢

**Ladles—**  
 Melting, Sargent's.....55¢10¢  
 Melting, Reading.....35¢10¢  
 Melting, Monroe's Pat.....# doz \$4.00, 40¢  
 Melting, P. S. & W.....35¢10¢40¢  
 Melting, Warner's.....30¢

**Lawn Mowers—**  
 Standard List.....50¢10¢  
 Quaker City.....60¢10¢  
 Enterprise.....60¢10¢

**Lanterns—**  
**Tubular—**  
 Plain with Guards, # doz.....\$4.00¢4.25  
 Lift Wire, with Guards.....\$4.50¢4.75  
 Square Plain, with Guards.....\$4.00¢4.25  
 Sq. Lift Wire, with Guards.....\$4.25¢4.50  
 Without Guards, 25 ¢ doz less.  
**Miscellaneous—**  
 Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75.....20¢25¢

**Lemon Squeezers—**  
 Porcelain Lined, No. 1.....# doz \$6.00, 25¢30¢  
 Wood, No. 2.....# doz \$3.00, 35¢  
 Wood, Common.....# doz \$1.70¢1.75  
 Dunlap's Improved.....# doz \$3.75, 20¢  
 Sammis.....No. 1, \$5.00; No. 2, \$6.12; \$18 ¢ doz.....25¢10¢  
 Jennings' Star.....# doz \$2.50  
 The Boss.....# doz \$2.50  
 Dean's, Nos. 1, # doz \$6.50; 2, \$3.35; 3, \$1.90  
 Little Giant.....50¢50¢5¢  
 King.....40¢5¢

**Lines—**  
 Cotton and Linen Fish, Draper's.....50¢  
 Draper's Chalk.....60¢  
 Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....25¢  
 Cotton Chalk.....55¢  
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50; No. 5, \$3.....10¢  
 Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 5, \$8.50; No. 6, \$9.00; No. 7, \$9.50; No. 8, \$10.00; No. 9, \$10.50; No. 10, \$11.00; No. 11, \$11.50; No. 12, \$12.00; No. 13, \$12.50; No. 14, \$13.00; No. 15, \$13.50; No. 16, \$14.00; No. 17, \$14.50; No. 18, \$15.00; No. 19, \$15.50; No. 20, \$16.00; No. 21, \$16.50; No. 22, \$17.00; No. 23, \$17.50; No. 24, \$18.00; No. 25, \$18.50; No. 26, \$19.00; No. 27, \$19.50; No. 28, \$20.00; No. 29, \$20.50; No. 30, \$21.00; No. 31, \$21.50; No. 32, \$22.00; No. 33, \$22.50; No. 34, \$23.00; No. 35, \$23.50; No. 36, \$24.00; No. 37, \$24.50; No. 38, \$25.00; No. 39, \$25.50; No. 40, \$26.00; No. 41, \$26.50; No. 42, \$27.00; No. 43, \$27.50; No. 44, \$28.00; No. 45, \$28.50; No. 46, \$29.00; No. 47, \$29.50; No. 48, \$30.00; No. 49, \$30.50; No. 50, \$31.00; No. 51, \$31.50; No. 52, \$32.00; No. 53, \$32.50; No. 54, \$33.00; No. 55, \$33.50; No. 56, \$34.00; No. 57, \$34.50; No. 58, \$35.00; No. 59, \$35.50; No. 60, \$36.00; No. 61, \$36.50; No. 62, \$37.00; No. 63, \$37.50; No. 64, \$38.00; No. 65, \$38.50; No. 66, \$39.00; No. 67, \$39.50; No. 68, \$40.00; No. 69, \$40.50; No. 70, \$41.00; No. 71, \$41.50; No. 72, \$42.00; No. 73, \$42.50; No. 74, \$43.00; No. 75, \$43.50; No. 76, \$44.00; No. 77, \$44.50; No. 78, \$45.00; No. 79, \$45.50; No. 80, \$46.00; No. 81, \$46.50; No. 82, \$47.00; No. 83, \$47.50; No. 84, \$48.00; No. 85, \$48.50; No. 86, \$49.00; No. 87, \$49.50; No. 88, \$50.00; No. 89, \$50.50; No. 90, \$51.00; No. 91, \$51.50; No. 92, \$52.00; No. 93, \$52.50; No. 94, \$53.00; No. 95, \$53.50; No. 96, \$54.00; No. 97, \$54.50; No. 98, \$55.00; No. 99, \$55.50; No. 100, \$56.00; No. 101, \$56.50; No. 102, \$57.00; No. 103, \$57.50; No. 104, \$58.00; No. 105, \$58.50; No. 106, \$59.00; No. 107, \$59.50; No. 108, \$60.00; No. 109, \$60.50; No. 110, \$61.00; No. 111, \$61.50; No. 112, \$62.00; No. 113, \$62.50; No. 114, \$63.00; No. 115, \$63.50; No. 116, \$64.00; No. 117, \$64.50; No. 118, \$65.00; No. 119, \$65.50; No. 120, \$66.00; No. 121, \$66.50; No. 122, \$67.00; No. 123, \$67.50; No. 124, \$68.00; No. 125, \$68.50; No. 126, \$69.00; No. 127, \$69.50; No. 128, \$70.00; No. 129, \$70.50; No. 130, \$71.00; No. 131, \$71.50; No. 132, \$72.00; No. 133, \$72.50; No. 134, \$73.00; No. 135, \$73.50; No. 136, \$74.00; No. 137, \$74.50; No. 138, \$75.00; No. 139, \$75.50; No. 140, \$76.00; No. 141, \$76.50; No. 142, \$77.00; No. 143, \$77.50; No. 144, \$78.00; No. 145, \$78.50; No. 146, \$79.00; No. 147, \$79.50; No. 148, \$80.00; No. 149, \$80.50; No. 150, \$81.00; No. 151, \$81.50; No. 152, \$82.00; No. 153, \$82.50; No. 154, \$83.00; No. 155, \$83.50; No. 156, \$84.00; No. 157, \$84.50; No. 158, \$85.00; No. 159, \$85.50; No. 160, \$86.00; No. 161, \$86.50; No. 162, \$87.00; No. 163, \$87.50; No. 164, \$88.00; No. 165, \$88.50; No. 166, \$89.00; No. 167, \$89.50; No. 168, \$90.00; No. 169, \$90.50; No. 170, \$91.00; No. 171, \$91.50; No. 172, \$92.00; No. 173, \$92.50; No. 174, \$93.00; No. 175, \$93.50; No. 176, \$94.00; No. 177, \$94.50; No. 178, \$95.00; No. 179, \$95.50; No. 180, \$96.00; No. 181, \$96.50; No. 182, \$97.00; No. 183, \$97.50; No. 184, \$98.00; No. 185, \$98.50; No. 186, \$99.00; No. 187, \$99.50; No. 188, \$100.00; No. 189, \$100.50; No. 190, \$101.00; No. 191, \$101.50; No. 192, \$102.00; No. 193, \$102.50; No. 194, \$103.00; No. 195, \$103.50; No. 196, \$104.00; No. 197, \$104.50; No. 198, \$105.00; No. 199, \$105.50; No. 200, \$106.00; No. 201, \$106.50; No. 202, \$107.00; No. 203, \$107.50; No. 204, \$108.00; No. 205, \$108.50; No. 206, \$109.00; No. 207, \$109.50; No. 208, \$110.00; No. 209, \$110.50; No. 210, \$111.00; No. 211, \$111.50; No. 212, \$112.00; No. 213, \$112.50; No. 214, \$113.00; No. 215, \$113.50; No. 216, \$114.00; No. 217, \$114.50; No. 218, \$115.00; No. 219, \$115.50; No. 220, \$116.00; No. 221, \$116.50; No. 222, \$117.00; No. 223, \$117.50; No. 224, \$118.00; No. 225, \$118.50; No. 226, \$119.00; No. 227, \$119.50; No. 228, \$120.00; No. 229, \$120.50; No. 230, \$121.00; No. 231, \$121.50; No. 232, \$122.00; No. 233, \$122.50; No. 234, \$123.00; No. 235, \$123.50; No. 236, \$124.00; No. 237, \$124.50; No. 238, \$125.00; No. 239, \$125.50; No. 240, \$126.00; No. 241, \$126.50; No. 242, \$127.00; No. 243, \$127.50; No. 244, \$128.00; No. 245, \$128.50; No. 246, \$129.00; No. 247, \$129.50; No. 248, \$130.00; No. 249, \$130.50; No. 250, \$131.00; No. 251, \$131.50; No. 252, \$132.00; No. 253, \$132.50; No. 254, \$133.00; No. 255, \$133.50; No. 256, \$134.00; No. 257, \$134.50; No. 258, \$135.00; No. 259, \$135.50; No. 260, \$136.00; No. 261, \$136.50; No. 262, \$137.00; No. 263, \$137.50; No. 264, \$138.00; No. 265, \$138.50; No. 266, \$139.00; No. 267, \$139.50; No. 268, \$140.00; No. 269, \$140.50; No. 270, \$141.00; No. 271, \$141.50; No. 272, \$142.00; No. 273, \$142.50; No. 274, \$143.00; No. 275, \$143.50; No. 276, \$144.00; No. 277, \$144.50; No. 278, \$145.00; No. 279, \$145.50; No. 280, \$146.00; No. 281, \$146.50; No. 282, \$147.00; No. 283, \$147.50; No. 284, \$148.00; No. 285, \$148.50; No. 286, \$149.00; No. 287, \$149.50; No. 288, \$150.00; No. 289, \$150.50; No. 290, \$151.00; No. 291, \$151.50; No. 292, \$152.00; No. 293, \$152.50; No. 294, \$153.00; No. 295, \$153.50; No. 296, \$154.00; No. 297, \$154.50; No. 298, \$155.00; No. 299, \$155.50; No. 300, \$156.00; No. 301, \$156.50; No. 302, \$157.00; No. 303, \$157.50; No. 304, \$158.00; No. 305, \$158.50; No. 306, \$159.00; No. 307, \$159.50; No. 308, \$160.00; No. 309, \$160.50; No. 310, \$161.00; No. 311, \$161.50; No. 312, \$162.00; No. 313, \$162.50; No.

**Melasses Gates—**

Stebbin's Pat.	70¢@70¢7½¢
Stebbin's Genuine	80¢@10¢10¢
Stebbin's Tinned Ends	40¢@10¢
Chase's Hard Metal	50¢@10¢
Bush's	20¢
Lincoln's Pattern	70¢@70¢10
Wood's	20¢@10¢
Boss, 7 doz:	
No. 1, 87; No. 2, 88; No. 3, 89; No. 4	60¢@10¢10¢

**Money Drawers—**

Muzzles—	
Safety	7 doz, \$3.00, 25¢

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny, 7 doz, \$2.50

**Nail Puller—**

Curtiss Hammer, 7 doz, \$9.00

Giant, No. 1, 7 doz, \$9.00, 10¢

Pelican, 7 doz, \$9.00, 25¢

Boss, 7 doz, \$9.00, 30¢

Lighting, 7 doz, \$21.00

**Nail Sets—**

Squares, 7 gr., \$4.00@4.25

Round, 7 gr., \$3.25

Cannon's Diamond Point, 7 gr., \$12.20

**Nut Crackers—**

Table (H. & B. Mfg. Co.), 40¢

Blake's Pattern, 7 doz, \$2.00, 10¢

Turner & Seymour Mfg. Co., 50¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square, Hex.

Hot Pressed, 5.4¢

Cold Punched, 5.4¢

In lots less than 100 lb., 7 lb., add 1¢; 1 lb.

**Oakum—**

Government, 7 lb, 7¢ @ 8¢

U. S. Navy, 7 lb, 6¢ @ 7¢

Navy, 7 lb, 5¢ @ 6¢

**Oilers—**

Zinc and Tin, 65¢@65¢10¢

Brass and Copper, 60¢@10¢50¢10¢

Malleable, Hammers, Improved, No. 1,

\$3.00; No. 2, \$4.00; No. 3, \$4.40 7 doz,

10¢@10¢10¢

Malleable, Hammers, Old Pattern, same

list, 40¢

Prior's Pat. or "Paragon" Zinc,

60¢@10¢10¢

Olmstead's Tin and Zinc, 60¢

Olmstead's Brass and Copper, 50¢

Broughton's Zinc, 60¢

Broughton's Brass, 50¢

**Packing, Steam—**

Rubber—

Standard, 60¢@10¢60¢10¢10¢

Extra, 60¢@10¢60¢

N. Y. B. & P. Co., Standard, 50¢@10¢50¢

N. Y. B. & P. Co., Empire, 70¢

N. Y. B. & P. Co., Salamander,

7 lb, 65¢, 30¢

Jenkins' Standard, 7 lb, 80¢, 35¢

**Miscellaneous—**

American Packing, 10¢@11¢ 7 lb

Russia Packing, 14¢ 7 lb

Italian Packing, 13¢@14¢ 7 lb

Cotton Packing, 15¢@17¢ 7 lb

Jute, 7¢@8¢ 7 lb

**Padlocks—**

See Locks.

**Pails—**

Galvanized Iron—

Quarts, 10 12 14

Hill's Light Weight, 7 doz, \$2.75 3.00 3.25

Hill's Heavy Weight, 7 doz, 3.00 3.25 3.40

Whiting's, 2.75 3.00 3.25

Sidney Shephard & Co., 2.80 3.00 3.40

Iron Glad, 2.75 3.00 3.25

Fire Buckets, 2.75 3.25 3.60

Buckets, see Well Buckets.

**Indurated Fibre Ware—**

Star Pails, 12 qt, 7 doz, \$4.50

Fire, Stable and Milk, 14 qt, 7 doz, \$5.85

**Pencils—**

Faber's Carpenters', high list 50¢

Faber's Round Gilt, 7 gr, \$5.25

Dixon's Lead, 7 gr, \$4.50

Dixon's Lumber, 7 gr, \$6.75

Dixon's Carpenters', 40¢@10¢

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;

6 to 7, \$13.00, 60¢@50¢60¢10¢

**Picture Nails—**

Brass Head, Sargent's list, 50¢@10¢10¢

Brass Head, Combination list, 50¢@10¢

Porcelain Head, Sargent's list, 50¢@10¢10¢

Porcelain Head, Combination list, 40¢@10¢

Niles' Patent, 40¢

Pinking Irons— 7 doz 65¢ net

Pipe, Wrought Iron—

1½ and under, Plain, List March 23, 1887,

1½ and under, Galvanized, 55¢

1½ and over, Plain, 47¢

1½ and over, Galvanized, 67¢

Boiler Tubes, Iron, 55¢

1½ and under, 57¢

2 in. to 2½ in., 62¢

3 in. and larger, 65¢

Planes and Plane Irons—

Wood Planes—

Molding, 50¢@50¢10¢

Bench, First Quality, 60¢@60¢50¢

Bench, Second Quality, 60¢@10¢60¢10¢10¢

Bailey's (Stanley R. & L. Co.), 40¢@10¢

Iron Planes—

Bailey's (Stanley R. & L. Co.), 40¢@10¢

Miscellaneous Planes (Stanley R. & L. Co.), 30¢@10¢

Victory Planes (Stanley R. & L. Co.), 20¢@10¢

Steer's Iron Planes, 35¢@35¢50¢

Meriden Mal. Iron Co.'s, 30¢@10¢30¢10¢10¢

Davis's Iron Planes, 30¢@10¢30¢10¢10¢

Birmingham Plane Co., 50¢@50¢50¢

Gage Tool Co.'s Self-Setting, 20¢@10¢

Chaplin's Iron Planes, 40¢@40¢50¢

Sargent's, 30¢@10¢30¢10¢10¢

**Plane Irons—**

Plane Irons, Butcher's	20¢@10¢
Plane Irons, Buck Bros.	50¢@50¢25¢ to 2
Plane Irons, Auburn Tool Co., "This	30¢
Plane Irons, Sandusky Tool Co.	40¢
Single and Cut	30¢
Double	40¢
L. & J. White	25¢

**Pliers and Nippers—**

Button's Patent	30¢@10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	\$21.00 7 doz
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers	60¢
Gas Pliers, Custar's Nickel Plated	60¢50¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	45¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinnars' Cutting Nippers,	add 5¢ dis 10¢
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel, 7 doz, \$12.00, 30¢50¢	
Cronk's 8 in., \$15.00; 10 in., \$21.00,	40¢@40¢50¢

**Plumbs and Levels—**

Regular List	70¢@10¢70¢10¢10¢
Disston's	45¢@10¢
Pocket Levels	70¢@10¢70¢10¢10¢
Davis Iron Levels	10¢@10¢
Davis' Inclometers	10¢@10¢

**Polish, Metal.**

Prestoline	30¢@10¢
Krestoline Paste	35¢
Gaston's Silver Compound	35¢

**Pokes, Animal—**

Bishop's I. X. L.	7 doz \$5.50
Bishop's O. K.	7 doz \$5.50
Bishop's Pioneer	7 doz \$5.75
Bishop's American	7 doz \$5.00

**Peppers, Corn—**

Round or Square, 1 qt., 7 gr, \$12.00@15.00

Round or Square, 2 qt., 7 gr, \$25.00@26.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger, 7 doz, \$36.00,

25¢@10¢

Fletcher Post Hole Augers, 7 doz, \$36.00,

25¢@10¢

Eureka Diggers, 7 doz, \$16.00@17.00

Leed's, 7 doz, \$8.00@9.00

Vaughan's Post Hole Auger, 7 doz,

\$13.00@14.00

Kohler's Little Giant, 7 doz, \$13.00

Kohler's Hercules, 7 doz, \$15.00

Kohler's New Champion, 7 doz, \$9.00

Schneider, 7 doz, \$18.00

Ryan's Post Hole Diggers, 7 doz, \$24.00

Cronk's Post Bars, 7 doz, \$80.00,

50¢@50¢10¢

Gibbs Post Hole Digger, 7 doz, \$30.00, 50¢

Imperial, 7 doz, \$15.00, 45¢

**Potato Parers—**

White Mountain, 7 doz, \$5.00@5.50

Antrim Combination, 7 doz, \$8.00

Hoosier, 7 doz, \$13.50

**Pruning Hooks and Shears—**

Disston's Combined Pruning Hook and

Saw, 7 doz, \$18.00, 30¢@10¢

Disston's Pruning Hook, 7 doz, \$12.00,

20¢@10¢

E. S. Lee & Co.'s Pruning Tools, 40¢

Pruning Shears, Henry's Pat., 7 doz,

\$3.75@4.00 net

Henry's Pruning Shears, 7 doz, \$4.25

Wheeler, M. & C. Co.'s Combination,

7 doz, \$12.00, 20¢

Dunlap's Saw and Chisel, 7 doz, \$15.50, 30¢

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

**Pulleys—**

Hot House, Awning, &c., 60¢@10¢

Japanese Screw, 30¢@10¢

Brass Screw, 60¢@10¢

Japanese Side, 60¢@10¢

Japanese Clothes Line, 60¢@10¢

Empire Sash Pulley, 55¢@60¢

Moore's Sash, Anti-Friction, 50¢

Hay Fork, Solid Eye, \$4.00; Swivel,

\$4.50, 60¢@10¢50¢10¢50¢

Hay Fork, "Anti-Friction," 5 in. Solid,

\$5.70, 50¢

Hay Fork, "F" Common and Pat.

Bushed, 20¢

Hay Fork, Tarbox Pat. Iron, 20¢

Hay Fork, Reed's Self-Lubricating, 60¢

Shade Rack, 45¢

Tackle Blocks, See Blocks

Moore's Anti-Friction 5 in. Wheel, 40¢

\$12.00, 40¢

**Pumps—**

Cistern, Best Makers, 50¢@10¢60¢

Pitcher Spout, Best Makers, 60¢@10¢60¢

Spring, good quality, 7 doz, \$2.50@2.80

Pitcher Spout, Cheaper Goods, 70¢@10¢50¢

**Punches—**

Saddlers' or Drive, good, 7 doz, 60¢@65¢

Bemis & Call Co.'s Cast Steel Drive, 50¢50¢

Bemis & Call Co.'s Spring Steel Socket, 50¢50¢

Spring, good quality, 7 doz, \$2.50@2.80

Spring, Leach's Pat., 15¢

Bemis & Call Co.'s Spring and Check, 40¢

Solid Tinnars', 7 doz, \$1.44, 55¢

Tinnars' Hollow Punches, 20¢20¢

Rice Hand Punches, 15¢

Avery's Revolving, 30¢@10¢

Avery's Saw-Set and Punch, See Saw Sets.

**Rail—**

Sliding Door, Wrt Brass, 7 lb, 35¢, 15¢

Sliding Door, Branded Wrt Iron, 7 lb, 7¢

Sliding Door, Iron, Painted, 7 lb, 4¢, 40¢

Barn Door, Light, 1 in., 1/2, 3/4, 1, 1 1/4,

Per 100 feet, \$2.00 2.50 3.10 3.10, 10¢

B. D. for N. E. Hangers—

Small, Med. Large,

Per 100 feet, \$2.15 2.70 3.25, net

Terry's Wrought Iron, 7 lb, 4¢, 45¢

Victor Track Rail, 7 lb, 7¢, 50¢

Carrier Steel Rail, 7 lb, 4¢, 45¢

Moore's Wrought Iron, 25¢

**Rakes—**

Cast Steel, Association goods, 65¢

Cast Steel, outside goods, 60¢@10¢70¢

Malleable, 70¢@70¢50¢

Globe Lawn Rake, 7 lb, 4¢, 50¢15¢

Canton Lawn Rake, \$9.00, 50¢40¢



<b>Machine—</b>	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
<b>Bench and Hand—</b>	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	70¢ doz \$2.25
Bench, Wood, Hickory.....	30¢10¢
Hand, Wood.....	25¢10¢25¢10¢10¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢4¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢5¢
Jack Screws, P. S. & W.....	30¢
Jack Screws, Sargent.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
<b>Scroll Saws—</b>	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	\$15.
Barnes' Scroll Saw Blades.....	35¢
<b>Scythe Snaths.....</b>	<b>50¢2¢</b>
<b>Shears—</b>	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning..... See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	70¢ doz \$3.75
Timmer's.....	20¢2¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	33¢4¢
First quality C. S. Trimmers.....	30¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	75¢10¢75¢10¢5¢
Victor Cast Shears.....	10¢10¢
Howe Bros. & Hulbert, Solid Forged.....	40¢
Steel.....	70¢
Chicago Drop Forge & F. Co., Solid.....	80¢
Steel Forged.....	70¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickelled, same list.....	60¢
<b>Sheaves—</b>	
<b>Sliding Door—</b>	
M. W. Co., List July, 1888.....	50¢10¢60¢5¢
R. & E., List Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢2¢
Patent Roller.....	60¢10¢2¢
Patent Roller, Hatfield's.....	70¢
Russell's Anti-Friction, List Dec. 18, 1885.....	60¢2¢
Moore's Anti-Friction.....	50¢
<b>Sliding Shutter—</b>	
R. & E., List Dec. 18, 1885.....	60¢10¢2¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
<b>Ship Tools—</b>	
L. & J. White.....	20¢5¢
Albertson Mfg. Co.....	25¢
<b>Shoes, Horse, Mule, &amp;c.—</b>	
<b>Horse—</b>	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
<b>Mule—</b>	
Add \$1 1/2 keg to above prices.	
<b>Or, Wrought—</b>	
Ton lots.....	70¢ 9¢
1000 lb lots.....	70¢ 9¢
500 lb lots.....	70¢ 10¢
<b>Shot—</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.16
Drop, 7 bag, 5 lb.....	20¢
Buck and Chilled, 7 25 lb bag.....	1.41
Buck and Chilled, 7 5 lb bag.....	34¢
<b>Shovels and Spades—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
NOTE.—Jobbers frequently give 5¢ to 7 1/2¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢60¢10¢
Griffith's Solid C. S. R. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢20¢75¢
St. Louis Shovel Co.....	15¢25¢
Hussey, Binns & Co.....	20¢20¢75¢
Hubbard & Co.....	50¢10¢
Lehigh Mfg. Co.....	50¢10¢
Payne Petebone & Son, list January, 1886.....	30¢
Remington's (Lowman's) Pat. 30¢10¢40¢	
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
<b>Shovels and Tongs—</b>	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
<b>Skins, Thimble—</b>	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
<b>Sieves—</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Barler Flour Sifters.....	70¢ doz \$2.00
Electric.....	70¢ gr \$18.00
Hunter's.....	70¢ gr \$21.00
Smith's Adjustable Sifters.....	70¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	70¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	70¢ doz \$1.25
<b>Sieves, Wooden Rim—</b>	
Mesh 18, Nested, 7 doz.....	70¢ 9¢
Mesh 20, Nested, 7 doz.....	85¢ \$1.00
Mesh 24, Nested, 7 doz.....	\$1.00 1.10
<b>Slates—</b>	
School, by case.....	40¢
<b>Snaps, Harness, &amp;c.—</b>	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	60¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢2¢
Covert, New Patent.....	50¢5¢2¢
Covert, New R. E.....	60¢2¢
Covered Spring.....	60¢10¢10¢

<b>Soldering Irons—</b>	
Covert's Adjustable, list Jan. 1, 1888.....	35¢2¢
<b>Spoke Shaves—</b>	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
<b>Spoke Trimmers—</b>	
Bonney's.....	70¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 70¢ doz.....	55¢10¢
Douglas.....	70¢ doz \$9.00, 20¢
<b>Spoons and Forks—</b>	
<b>Tinned Iron—</b>	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s.....	70¢10¢
list.....	70¢10¢
Buffalo S. S. & Co.....	35¢2¢
<b>Silver Plated—</b> (4 mos. or 5¢ cash 30 days)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bros.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	60¢10¢
Holmes & Edwards Silver Co.....	50¢10¢60¢
L. Boardman & Son.....	50¢10¢
<b>Miscellaneous—</b>	
Holmes & Edwards Silver Co.:.....	
No. 67 Mexican Silver.....	50¢10¢
No. 80 Silver Metal.....	50¢10¢
No. 24 German Silver.....	60¢10¢
No. 50 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	60¢10¢
German Silver.....	50¢50¢5¢
German Silver, Hall & Elton.....	50¢5¢ cash
Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	60¢
Boardman's Nickel Silver.....	60¢
Boardman's Britannia Spoons, case.....	60¢
lots.....	60¢
<b>Springs—</b>	
Elliptic, Concord, Platform and Half.....	60¢60¢5¢
Scroll.....	60¢60¢5¢
Cliff's Bolster Springs.....	25¢
<b>Squares—</b>	
Steel and Iron.....	75¢10¢80¢
Nickel Plated.....	75¢10¢80¢
Try Square and T Bevels.....	60¢10¢60¢10¢
Disston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢5¢
<b>Staples—</b>	
Fence Staples, Galvanized.....	Same price as B. & W. Wire
Fence Staples, Plain.....	See Trl. Rep.
<b>Steelyards.....</b>	<b>40¢10¢50¢</b>
<b>Stocks and Dies—</b>	
Blacksmith's.....	
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢4¢5¢40¢
<b>Stone—</b>	
Hindostan No. 1, 3¢; Axe, 3 1/2¢; Slips.....	
No. 1, 4 1/2¢.....	70¢ 2 1/2¢
Sand Stone.....	70¢ 2 1/2¢
Washita Stone, Extra.....	70¢ 15¢20¢
Washita Stone, No. 1.....	70¢ 14¢15¢
Washita Stone, No. 2.....	70¢ 14¢15¢
Washita Slips, No. 1, Extra.....	70¢ 35¢38¢
Washita Slips, No. 1.....	70¢ 24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	70¢ \$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	70¢ \$1.85
Turkey Oil Stone, 4 to 8 in.....	70¢ \$1.40
Turkey Slips.....	70¢ \$1.00, \$1.50
Lake Superior, Chase.....	70¢ \$1.15
Lake Superior Slips, Chase.....	70¢ \$1.35
Seneca Stone, Red Paper Brand.....	70¢ 18¢20¢
Seneca Stone, High Rounds.....	70¢ 20¢25¢
Seneca Stone, Small Whets.....	70¢ \$2.40
<b>Steve Polish—</b>	
Joseph Dixon's.....	70¢ gr \$6.00, 10¢
Gem.....	70¢ gr \$4.50, 10¢
Gold Medal.....	70¢ gr \$6.00, 25¢
Mirror.....	70¢ gr \$6.00, 1¢
Lustro.....	70¢ gr \$4.75
Ruby.....	70¢ gr \$3.75
Rising Sun, 5 gro lots.....	70¢ gr \$5.50
Dixon's Plumbago.....	70¢ \$5.00
Boynton's Noon Day.....	70¢ gr \$3.00
Parlor Pride Stove Enamel.....	70¢ gr \$3.00
Yates' Liquid.....	70¢ 5 10¢ gal.....
7 gal.....	\$0.90 \$0.70
Yates Standard Paste Polish, 10 lb cans.....	70¢ 15¢
Jet Black.....	70¢ gr \$3.50
Japanese.....	70¢ gr \$3.50
Firestone.....	70¢ gr \$2.50
Diamond O. K. Enamel.....	70¢ gr \$19.00
Bonnell's Liquid Stove Polish.....	70¢ gr \$6.00
Bonnell's Paste Stove Polish.....	70¢ gr \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	70¢ 13¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....	70¢ 12¢4¢
Nickel Plate Paste.....	70¢ gr \$6.00
<b>Tacks, Brads, &amp;c.—</b>	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢5¢
Steel Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	80¢80¢5¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢75¢10¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout.....	50¢10¢
Nails.....	60¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢

<b>Common and Patent Brads, 70¢10¢70¢</b>	<b>10¢10¢</b>
<b>Hungarian Nails.....</b>	<b>70¢10¢70¢10¢10¢</b>
<b>Chair Nails.....</b>	<b>70¢10¢70¢10¢10¢</b>
<b>Zinc Glaziers' Points.....</b>	<b>50¢50¢5¢</b>
<b>Cigar Box Nails.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Picture Frame Points.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Looking-Glass Tacks.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Leathered Carpet.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Brush Tacks.....</b>	<b>50¢10¢50¢10¢5¢</b>
<b>Shoe Finders, List Jan. 2, 1888.....</b>	<b>10¢10¢5¢</b>
<b>Lining and Saddle Nails, List Jan. 1, 1888.....</b>	<b>10¢10¢5¢</b>
<b>Silvered.....</b>	<b>30¢10¢10¢</b>
<b>Japanned.....</b>	<b>30¢10¢10¢</b>
<b>Double-Pointed Tacks.....</b>	<b>85¢</b>
<b>Wire Carpet Nails.....</b>	<b>50¢10¢</b>
<b>Wire Brads &amp; Nails, see Nails, Wire.....</b>	<b>50¢10¢</b>
<b>Steel-Wire Brads, R. &amp; E. Mfg. Co.'s.....</b>	<b>50¢10¢5¢</b>
<b>list.....</b>	<b>50¢10¢5¢</b>
<b>Tap Borers—</b>	
Common and Rind.....	20¢10¢
Ive's Tap Borers.....	33¢4¢5¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33¢4¢5¢
<b>Tapes, Measuring—</b>	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
<b>Thermometers—</b>	
Tin Case.....	80¢80¢10¢
<b>Thimble Skelns—See Skelns.</b>	
<b>Ties, Bale-Steel</b>	
Standard Wire, list.....	50¢10¢5¢
<b>Timers' Shears, &amp;c.—</b>	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢4¢
<b>Tinware—</b>	
Stamped, Japanned and Plated, list.....	75¢75¢5¢
Jan. 20 1887.....	75¢75¢5¢
<b>Tire Benders, Upsetters, &amp;c.—</b>	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
<b>Tobacco Cutters—</b>	
Champion.....	20¢10¢30¢
Wood Bottom.....	70¢ doz \$5.00, \$5.25
All Iron.....	70¢ doz \$4.25
Nashua Lock Co.'s 70¢ doz, \$18.00 50¢55¢	
Wilson's.....	55¢
Sargent's.....	70¢ doz, \$24, 55¢10¢
Acme.....	70¢ doz, \$20.00, 40¢
<b>Transom Lifters—</b>	
Wollensak's.....	
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronzed Metal.....	35¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reith's, list Jan. 1, 1887.....	50¢10¢2¢
Bronzed Iron Rods.....	50¢10¢2¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	60¢10¢2¢
Saw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
<b>Traps—</b>	
<b>Game—</b>	
Newhouse.....	35¢40¢5¢
Onelida Pattern.....	70¢70¢5¢
Game, Blake's Patent.....	40¢10¢5¢
<b>Mouse and Rat—</b>	
Mouse Wood Choker, 70¢ doz holes, 11¢12¢	
Mouse, Round Wire.....	70¢ doz \$1.50, 10¢
Mouse, Cage, Wire.....	70¢ doz \$2.50, 10¢
Mouse, Box, alive.....	70¢ doz \$2.50, 10¢
Mouse, "Bonanza".....	70¢ gr \$10.00
Mouse Delusion.....	70¢ gr \$15.00
Rat, "Decoy".....	70¢ gr \$10.00, 10¢
Ideal.....	70¢ gr \$10.00
Cyclone.....	70¢ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	70¢ doz \$0.20
In full cases.....	70¢ doz 75¢
<b>Trawls—</b>	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diastone Brick and Plastering.....	25¢25¢10¢
Pence's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
<b>Triers—</b>	
Butter and cheese.....	25¢
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co.'s list '82.....	40¢
<b>Tubes, Boiler—</b>	
See Pipe.....	
<b>Twine—</b>	
Flax Twine.....	BC. B.
No. 12, 1/4 and 1/2 B Balls.....	25¢ 32¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 29¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 30, 1/4 and 1/2 B Balls.....	18¢ 27¢
No. 264, Matras, 1/4 and 1/2 B Balls.....	48¢50¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Mason Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp 1/4 and 1/2 B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1 B Balls.....	12¢12¢4¢
3-Ply Hemp, 1 1/2 B Balls.....	11¢11¢4¢
Cotton Wrapping, 5 Balls to B.....	15¢16¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool.....	6¢4¢6¢4¢
Paper.....	15¢14¢
Cotton Mops, 6, 9, 12 and 15 B to doz.....	18¢
<b>Vises—</b>	
Solid Box.....	60¢60¢5¢
Parallel.....	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢

Parker's.....	20¢25¢
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢25¢40¢10¢
Sargent's.....	15¢20¢
Backus and Union.....	60¢10¢10¢
Double Screw Leg.....	40¢
Prentiss.....	15¢10¢
Simpson's Adjustable.....	30¢5¢25¢
Moore's.....	40¢
Saw Filers—	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns'.....	33¢4¢10¢33¢4¢10¢10¢
Stearns' Silent Saw Vises.....	33¢4¢35¢
Sargent's.....	60¢4¢10¢
Hopkins'.....	70¢ doz \$17.50, 10¢
Reading.....	40¢10¢
Wentworth.....	20¢10¢
Combination Hand Vises.....	70¢ gr \$42.00
Cowell Hand Vises.....	20¢
Bauer's Pipe Vises.....	10¢
Wagon Boxes—	
Per B.....	34¢
Wagon Jacks—	
Daisy.....	25¢
Washer Cutters—	
Smith's Pat.....	70¢ doz \$12.00, 20¢10¢75¢
Johnson's.....	70¢ doz \$11.00, 38¢4¢
Penny's, 70¢ doz Pol. \$14; Jap'd, \$18.00, 55¢	
Appleton's.....	70¢ doz \$16.00, 60¢10¢
Bonney's.....	70¢ doz \$16.00, 60¢10¢
Washers—	
Size.....	5-18 3/4 5/8 3/4 1/2 3/8 1/4 1/8
Wedges.....	5/8 3/4 1/2 3/8 1/4 1/8
In lots less than 200 B, 70¢ B, add 1/4¢, 5-B boxes 1¢ to list.	
Wedges—	
Iron.....	70¢ B 34¢
Steel.....	70¢ B 4¢
Well Buckets, Galvanized—	
Hill's.....	70¢ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad.....	70¢ doz, 14 qt, \$4.25; 16 qt, \$5.25
Whiting's Flat Iron Band.....	\$4.25-4.50
Whiting's Wired Top.....	70¢ doz \$4.00-4.25
Well Wheels—	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
Wire—	
Iron—	
Market.	
Br. & Ann., Nos. 0 to 18.....	70¢10¢75¢
Cop'd, Nos. 0 to 18.....	70¢70¢25¢
Galv., Nos. 0 to 18.....	55¢25¢
Tin'd, Tinned list Nos. 0 to 18.....	67¢4¢
Br. and Ann'd, Nos. 16 to 18, 75¢4¢	
Br. and Ann'd, Nos. 19 to 26, 75¢4¢	
Br. and Ann'd, Nos. 27 to 36, 75¢4¢10¢25¢	
Tinned Broom Wire.....	70¢70¢10¢
Tinned Broom Wire.....	70¢25¢70¢10¢
Galvanized Fence.....	65¢
Annealed Fence, Nos. 8 and 9.....	75¢
Annealed Grape, Nos. 10 to 14.....	75¢
Brass, list Jan. 18, 1884.....	15¢20¢
Copper, list Jan. 18, 1884.....	See Trade Report
Barb Fence.....	See Trade Report
Wire on Spools.....	65¢
Mallin's Steel and Tin'd Wire on Spools.....	40¢
Mallin's Brass and Cop. Wire on Spools 30¢	
Stub Steel Wire.....	50¢
Stub Steel Wire.....	\$6.00 to 2, 30¢
Picture Wire.....	New list, 50¢
Barb Wire Safety Guards.....	See 1000, \$6.00, 25¢
Wire Clothes Lines, see Lines.....	
Wire Cloth, Netting, &c.—	
Painted Screen Cloth, good quality.....	70¢ 100 sq. ft., \$1.80 to \$1.90
Galvanized Wire Netting.....	75¢75¢25¢
Wire Goods—	
See Bright Wire Goods.	
Wire Rope—	
List May 1, 1886.	
Iron.....	30¢
Cast Steel.....	40¢
Wrenches—	
American Adjustable.....	40¢
Baxter's Adjustable "8".....	40¢10¢50¢
Baxter's Diagonal.....	40¢10¢50¢
Coe's Genuine.....	55¢25¢
Coe's Mechanics.....	55¢10¢25¢
Girard Steel.....	70¢10¢
Machinists', Sterling Wrench Co. 70¢10¢	
Lamson & Sessions' Engineers'.....	60¢10¢
Lamson & Sessions' Standard.....	70¢10¢
Goes' Pattern, Wrought.....	80¢90¢25¢
Girard Agricultural.....	80¢90¢25¢
Lamson & Sessions' Agric'l.....	
Sterling Wrought.....	
Bemis & Call's.....	
Pat. Combination.....	35¢
Merrick's Pattern.....	35¢
Briggs' Pattern.....	25¢
Cylinder or Gas Pipe.....	43¢15¢
No. 3 Pipe.....	40¢10¢
Aiken's Pocket (Bright).....	\$6.00, 50¢10¢
The Favorite Pocket.....	70¢ doz \$4.00, 40¢
Webster's Pat. Combination.....	25¢
Boardman's.....	20¢10¢
Always Ready.....	25¢25¢
Aligator.....	20¢10¢
Donne's Engineer.....	20¢10¢
Acme, Bright.....	60¢25¢
Acme, Nickeled.....	50¢25¢
Walker's.....	55¢25¢
Diamond Steel.....	55¢25¢
Wringers, Clothes—	
List March 11, 1889, 2¢ cash.	
Wrought Goods—	
Staples, Hooks, &c., list Jan. 12, 1886,	
	80¢25¢83¢45¢

# CURRENT METAL PRICES.

MAY 8, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

**IRON AND STEEL.**

**Bar Iron from Store.**

Common Iron:

1/2 to 2 in. round and square... 1/2 lb 1.90 @ ...

Refined Iron:

1/2 to 2 in. round and square... 1/2 lb 2.00 @ 2.10

1 to 4 in. x 1/2 to 1 in. ... 1/2 lb 2.30 @ 2.30

4 1/2 to 6 in. x 1/2 to 1 in. ... 1/2 lb 2.30 @ 2.30

1 to 6 in. x 3/4 and 5-16 ... 1/2 lb 2.30 @ 2.30

Rods—1/2 and 1-16 round and sq. ... 1/2 lb 2.10 @ 2.20

Bands—1 to 6 x 3-16 to No. 12 ... 1/2 lb 2.20 @ 2.30

"Burden's Best" Iron, base price ... 1/2 lb 3.00 @ ...

"Burden's" "H. B. & S." Iron, base price ... 1/2 lb 2.80 @ ...

"Ulster" ... 1/2 lb 3.10 @ ...

Norway Rods ... 4.00 @ 5.00

**Merchant Steel from Store.**

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots ... 2 1/2

Best Cast Steel, base price in small lots ... 8

Best Cast Steel Machinery, base price in small lots ... 5

**Sheet Iron from Store.**

Common American. R. G. Cleaned.

10 to 16 ... 1/2 lb 2.75 @ 2.80

17 to 20 ... 1/2 lb 2.85 @ 2.90

21 to 24 ... 1/2 lb 3.00 @ 3.10

25 and 26 ... 1/2 lb 3.20 @ 3.30

27 ... 1/2 lb 3.35 @ 3.37

28 ... 1/2 lb 3.50 @ 3.52

B. B.

Galv'd, 14 to 20 ... 1/2 lb 4.50 @ 4.55

Galv'd, 1 to 24 ... 1/2 lb 4.87 1/2 @ 4.75

Galv'd, 25 to 36 ... 1/2 lb 5.25 @ 5.12

Galv'd, 27 ... 1/2 lb 5.62 1/2 @ 5.48

Galv'd, 28 ... 1/2 lb 6.00 @ 5.85

Patent Planished ... 1/2 lb A 10 1/2 B, 9 1/2

Russia ... 1/2 lb 9 1/2 @ 10 1/2

American Cold Rolled B. B. ... 1/2 lb B 5 1/2 @ 7 1/2

**English Steel from Store.**

Best Cast ... 1/2 lb 15

Extra Cast ... 1/2 lb 16 1/2

Swaged, Cast ... 1/2 lb 16

Best Double Shear ... 1/2 lb 15

Ulster, 1st quality ... 1/2 lb 13

German Steel, Best ... 1/2 lb 10

2d quality ... 1/2 lb 9

3d quality ... 1/2 lb 8

Sheet Cast Steel, 1st quality ... 1/2 lb 15

2d quality ... 1/2 lb 14

3d quality ... 1/2 lb 13 1/2

**METALS.**

**Tin.**

Banca, Pigs ... 28

Straits, Pigs ... 22

English, Pigs ... 23 1/2

Straits in Bars ... 24

**Tin Plates.**

**Charcoal Plates.—Bright.**

Melvin Grade.

IC, 10 x 14 ... 5.75 @ 6.00

IC, 12 x 12 ... 6.00 @ 6.25

IC, 14 x 20 ... 5.75 @ 6.00

IC, 20 x 28 ... 12.50 @ 12.50

IX, 10 x 14 ... 7.25 @ 7.50

IX, 12 x 12 ... 7.50 @ 7.75

IX, 14 x 20 ... 7.25 @ 7.50

IX, 20 x 28 ... 15.00 @ 15.50

DC, 12 1/2 x 17 ... 5.50 @ 5.75

DX, 12 1/2 x 17 ... 7.00 @ 7.25

Call and Grade.

IC, 10 x 14 ... 5.75 @ 6.00

IC, 12 x 12 ... 6.00 @ 6.25

IC, 14 x 20 ... 5.75 @ 6.00

IX, 10 x 14 ... 7.25 @ 7.50

IX, 12 x 12 ... 7.50 @ 7.75

IX, 14 x 20 ... 7.25 @ 7.50

IX, 20 x 28 ... 15.00 @ 15.50

DX, 12 1/2 x 17 ... 5.50 @ 5.75

DX, 12 1/2 x 17 ... 7.00 @ 7.25

Allaway Grade.

IC, 10 x 14 ... 5.00 @ 5.12 1/2

IC, 12 x 12 ... 5.12 1/2 @ 5.25

IC, 14 x 20 ... 5.00 @ 5.12 1/2

IX, 10 x 14 ... 11.00 @ 11.25

IX, 12 x 12 ... 6.00 @ 6.25

IX, 14 x 20 ... 6.25 @ 6.50

IX, 20 x 28 ... 12.00 @ 12.25

DC, 12 1/2 x 17 ... 4.75 @ 5.00

DX, 12 1/2 x 17 ... 5.75 @ 6.00

**Coke Plates.—Bright.**

Steel Coke.—IC, 10 x 14, 14 x 20 ... \$4.75 @ \$5.00

10 x 20 ... 7.25 @ 7.50

20 x 28 ... 9.75 @ 10.25

IX, 10 x 14, 14 x 20 ... 5.50 @ 5.75

BV Grade.—IC, 10 x 14, 14 x 20 ... 4.40 @ 4.60

**Charcoal Plates.—Terne.**

Dean Grade.—IC, 14 x 20 ... \$4.85 @ \$4.92 1/2

20 x 28 ... 8.75 @ 9.25

IX, 14 x 20 ... 5.40 @ 5.62 1/2

20 x 28 ... 11.00 @ 11.37 1/2

Abecarne Grade.—IC, 14 x 20 ... 4.25 @ 4.50

20 x 28 ... 8.45 @ 9.00

IX, 14 x 20 ... 5.25 @ 5.50

20 x 28 ... 10.50 @ 10.80

**Tin Boiler Plates.**

IX, 14 x 26 ... 112 sheets ... \$12.50 @ \$12.75

IX, 14 x 28 ... 112 sheets ... 12.75 @

IX, 14 x 31 ... 112 sheets ... 14.25 @

**Copper.**

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ 1/2 lb. Manufactured (including all articles of which Copper is a component of chief value), 45¢ ad valorem.

**Ingot.**

Lake ... @ 15 1/2

"Anchor" Brand ... @ 15

**Sheet and Bolt.**

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound.							
			Over 64 oz.	62 to 64 oz.	60 to 62 oz.	58 to 60 oz.	56 to 58 oz.	54 to 56 oz.	52 to 54 oz.	Less than 52 oz.
30	72		25	25	25	26	27	28	31	33
30	72		25	25	25	26	27	28	30	34
36	96		25	25	25	27	29	30	33	
36	96		25	25	26	28	30	34	38	
48	96		25	25	27	29	31	35		
48	96		25	25	23	30	32	36		
60	96		25	25	30	32	37			
60	96		25	26	31					
84	96		26	27						
84	96		27	28						
Over 84 in. wide			28	30						

All Bath Tub Sheets ... 16 oz. 14 oz. 12 oz. 10 oz. Per pound ... \$0.53 0.30 0.23 0.25

Bolt Copper, 1/2 inch diameter and over, per pound ... 25

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 3 cents per pound over the foregoing prices.

**Copper Bottoms, Pits and Flats.**

Per pound.

14 ounce to square foot and heavier ... 22 1/2

12 ounce and up to 14 ounce to square foot ... 20 1/2

10 ounce and up to 12 ounce ... 31 1/2

Circles less than 8 inches diameter 3 cents per pound additional.

Circles over 18 inches diameter are not classed as Copper Bottoms.

**Tinning.**

Tinning sheets on one side, 10, 12 and 14 x 48 each ... 8

Tinning sheets on one side, 30 x 60 each ... 80

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each ... 15 1/2

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ... 12 1/2

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each ... 12 1/2

Tinning sheets on one side, other sizes, per square foot ... 21 1/2

For tinning both sides double the above prices.

**Planished Copper.**

Planished Copper List May 5, 1888 ... Net

**Seamless Brass and Copper Tubes.**

O. G.	N. G.	3/4	1/2	3/8	1/4	1/8	1/16
8-14	6-12	38	34	31	30	29	28
15	13	39	34	32	31	30	29
16	14	40	35	33	32	31	30
17	15	41	36	34	33	32	31
18	16	43	37	35	34	33	32
19	17	44	38	36	35	34	33
20	18	45	40	38	37	36	35
21	20	47	42	40	39	38	37
22	21	49	43	41	40	39	38
23	22	51	45	43	42	41	40
24	23	54	47	45	44	42	41
25	24	57	50	47	46	44	43

Copper, Bronze and Gliding Tube, 3¢ 1/2 lb additional.

**Brass Tubing.** (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive ... 35

Plain, above 3 inch ... 45

Plain, 5-16 inch ... 45

Plain, 1/4 inch ... 60

Plain, 3-16 inch ... 60

Plain, 1/2 inch ... 1.50

Fancy Tubing, Brass, to No. 20, inclusive ... 43 1/2

Bronze Tubing, 3¢ 1/2 lb more than Brass.

Discount from list ... 20

**Roll and Sheet Brass.**

Discount from list ... 10 @ 15

**High Brass Rods.**

Over 1 inch diameter ... 27 1/2

1/4 inch to 1 inch diameter, both inclusive ... 24 1/2

No. 8 and less than 1/4 inch diameter ... 26 1/2

Smaller than No. 8 ... 30 1/2

Hexagon, Octagon and Square, 2¢ 1/2 lb advance over Round Rods.

**Spelter.**

Duty: Pig, Bars and Plates, \$1.50 100 lb.

Western Spelter ... 34 1/2 @ 54 1/2

"Bergenport" ... 34 1/2 @ 54 1/2

"Bertha" ... 74 @ 84

**Zinc.**

Duty: Sheet, 2 1/2¢ 100 lb.

600 lb casks ... 61 1/2

Per lb ... 7 1/2

**Lead.**

Duty: Pig, 32 100 lb. Old Lead, 2¢ 1/2 lb. Pipe and Sheets, 3¢ 1/2 lb.

American ... 4 1/2

Newark ... 4 1/2

Bar, subject to trade discount ... 5 1/2

Pipe, subject to trade discount ... 15

Tin-Lined Pipe, subject to trade discount ... 45

Block Tin Pipes, subject to trade discount ... 6 1/2

Sheet, subject to trade discount ... 6 1/2

**Solder.**

1/2 @ 1/2 (Guaranteed) ... 14 1/2

Extra Wiping ... 13

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

**Antimony.**

Cookson ... 14 1/2

Hallett's ... 13 1/2

**Fittings.**

Cast Iron Fittings, Black and Galvanized, Standard sizes ... 70 1/2

Cast Iron Fittings, Bushings and Plugs ... 75 1/2

Cast Iron Fittings, Flanges ... 70 1/2

Malleable Iron Bushings ... 75 1/2

Malleable Iron Unions ... 67 1/2

Malleable Iron American Unions ... 55

Wrought Iron Nipples ... 70 1/2

Wrought Iron Couplings ... 70

Wrought Iron Long Screws ... 70

Casing Fittings ... 60

Malleable Iron Fittings ... 25

**Valves, Cocks, &c.**

Iron Body Valves ... 70

Throttle Valves, Iron Body ... 70

All-iron Valves ... 65

Compression Gauge Cocks ... 60

Mississippi Gauge Cocks ... 60

Register Gauge Cocks ... 65

Air Cocks and Radiator Air Cocks ... 65

Steam Gauge Cocks ... 60

Oil Cups, Plain, Elbow, new pattern, T and Lever Handle ... 65

Globe Oil Cups ... 65

Common Lubricators ... 65

Lubricators with Air Cocks ... 65

Iron Body Lubricators ... 60

Steam Whistles ... 65

Whistle Valves ... 65

Water Gauges ... 65

Brass Expansion Joints ... 55

Pump Valves ... 55

Soldering Unions ... 65

Soldering Nipples ... 70

Brass Unions (Union Joints) ... 65

Radiator Nipples ... 60

Fuel Pumps ... 60

Oil Pumps ... 55

Self-Acting Air Valves ... 55

Vacuum Valves ... 55

Steam Swing Joints ... 55

Iron Strainers ... 55 1/2

Jenkins' Iron Body Valves, except Gate Valves ... 60 1/2

Jenkins' All-iron Valves, except Gate Valves ... 60

Jenkins' All-iron Gate Valves ... 55

Iron Cocks, all iron ... 65

Iron Cocks, with Brass Plugs ... 65

Brass Globe, Angle and Cross Valves ... 65

Brass Globe Valves, Finished ... 45

Brass Globe and Angle Valves, hose outlet ... 65

Brass Garden Hose Valves ... 65

Brass Caps for Hose Valves ... 60

Brass Horizontal, Vertical and Angle Check Valves ... 65

Brass Safety Valves ... 65

Brass Safety Valves, low pressure ... 65

Brass Safety Valves, low pressure, with balance weight ... 65

Brass Butterfly Valves ... 55

Brass Throttle Valves ... 55

Brass Radiator Valves ... 65

Brass Radiator Valves, Jenkins' ... 65

Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves ... 65

Brass Jenkins' Gate Valves ... 50

Brass Steam Cocks ... 60

Brass Gas Meter and Union Meter Cocks ... 60

Brass Fittings, Rough ... 60

Brass Fittings, Finished ... 60

Brass Bushings ... 60

**Plumbers' Brass Work.**

Ground Key Work, Rough ... 60

Ground Key Work, Finished ... 55

Compression Work ... 60

Compression Work, Grundy, Heavy Pattern ... 55

Chain Stays ... 60

Iron Boiler Couplings, Ground Face, per set \$1 ... net

Basin Plugs ... 60

Sink or Bath and Wash Tray Plugs ... 60

Basin Clamps ... 55

**Paints.**

Black, Lamp—Coach Painters ... 23 @ 24

Ordinary ... 6

Black, Ivory Drop, fair ... 12 @ 15

best ... 35

Black Paint, in oil ... 40 @ 55

Blue, Prussian, fair to best ... 40 @ 55

in oil ... 45 @ 55

Chinese dry ... 70

Ultramarine ... 18 @ 30

Brown, Spanish ... 14

Van Dyke ... 10 @ 12

Dryers, Patent American, ass'd cans, 9¢; kegs, 7¢

Green, Chrome ... 15 @ 23

Green, Chrome in oil ... 14 @ 18 @ 25

Green, Paris ... good, 20¢; best, 25¢

Green, Paris in oil ... good, 30¢; best, 35¢

Iron Paint, Bright Red ... 24 1/2

Iron Paint, Brown ... 14 1/2

Iron Paint, Purple ... 14 1/2

Iron Paint, Ground in oil, Bright Red ... 61 1/2

Iron Paint, Ground in oil, Red ... 51 1/2

Iron Paint, Ground in oil, Brown ... 51 1/2

Iron Paint, Ground, Purple ... 61 1/2

Litharge ... 61 1/2

Mineral Paints ... 2 @ 4

# THE IRON AGE

THURSDAY, MAY 16, 1889

## To Test Boilers for the New Cruiser.

One of Secretary Tracy's first acts on assuming the control of the Navy Department was to revive the Board of Engineers on Experiment at the New York Navy-Yard, which for many years after the close of the Civil War did so much valuable service in ascertaining the practical value of inventions and improvements in steam machinery, boilers and fuses. The new board consists of the ex-chief of the Bureau of Steam Engineering, Charles H. Loring, as president, and Chief Engineer

bility, will be adopted in the coast-defense vessel, provided that the price is satisfactory to the Navy Department. Only such boilers as appear to possess merit will be tested for the purpose. The boilers offered for test must be of the type and approximately of the same size as those required by the plans intended for the vessel, and the manufacturers must prepare them for the test at their iron works or at such place as may be arranged with the Department.

An evaporate test of not less than 24 hours' duration, using clean and fresh

## The Putnam Steam-Engine Valves.

The high-pressure variable cut-off engine made by the Putnam Machine Company, of Fitchburg, Mass., has a wide reputation as being a well-designed and well-built machine. We herewith present several engravings illustrating the valve-gear, the valves being of the double-poppet form. The valves are operated by a side-shaft placed parallel with the axis of the cylinder, and extending beneath the valve-chests and operated by the main shaft through suitable gearings, as shown

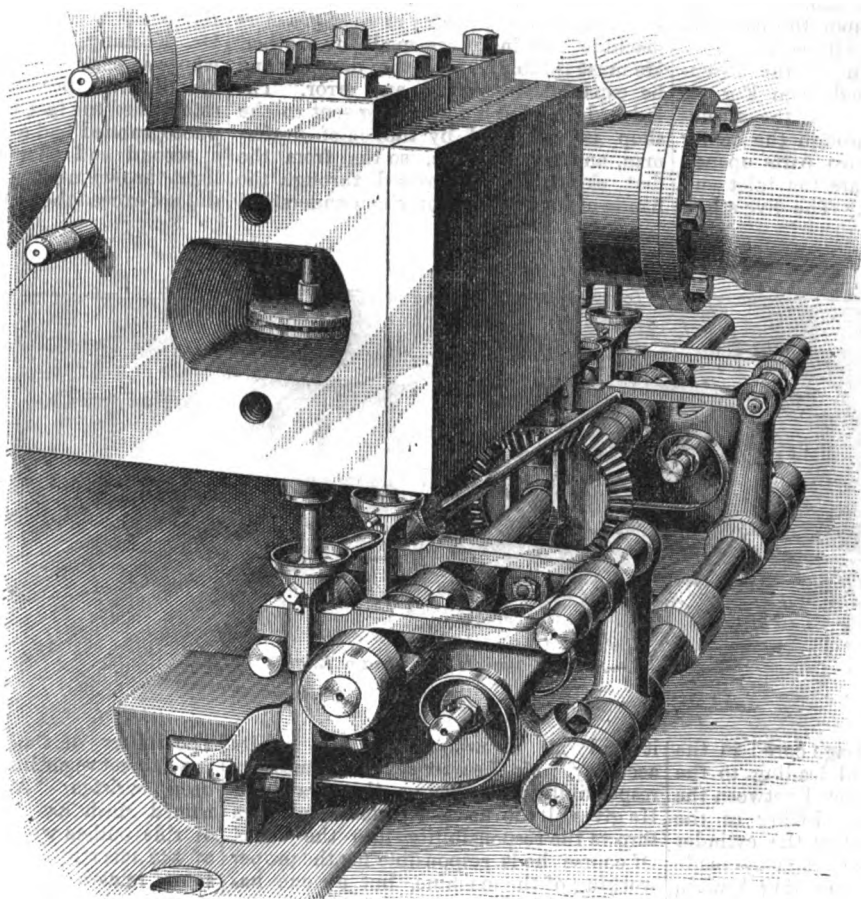


Fig. 1.

## THE PUTNAM STEAM-ENGINE VALVES.

Louis J. Allen as executive, and an assistant. As the new coast-defense vessel must be fitted with them, the board is about to begin experiments with and tests of the various tubular, sectional or coil boilers to determine the best type.

They must be designed to furnish continuously, under forced draft, with due economy, at least three-fourths of the steam necessary to work triple-expansion engines of 4800 initial horse-power at 160 pounds gauge pressure. The boiler which appears to the Department, after investigation, to be the best for the purpose, taking into account the evaporative efficiency, the dryness of the steam, the weight of the boiler, the weight of the water contained, the accessibility for repairs, the simplicity and interchangeability of the parts, the space occupied, the ease of firing and of regulating the feed of the water, the suitability for working in battery, the capability of long-continued steaming without cleaning and the dura-

water, will be made at the rate of combustion proposed to be used on the vessel, all feed-water being measured in tanks to be furnished by the manufacturer, the coal weighed and the steam tested for dryness. Boilers which give good results in evaporation will be further tried by being surrounded by walls representing the adjacent bulkheads on board ship, and joints will be made and unmade in this limited room to prove that repairs can be properly made in the space available. The boiler which gives the best results will be again subjected to a test to show whether or not it will work satisfactorily under the everyday conditions existing on board ship. Several designs have been promised to be submitted.

The Anglo-American Electric Light Company, of New York, are offering treasury stock to enable them to enlarge their manufactory of electrical accumulators.

in Fig. 3. The steam-chests are placed one at each end of the cylinder. On this shaft are placed four cams—one for each valve—shaped as shown in Fig. 4. The cams operate, by raising the free ends, cam-levers, which in turn actuate the valves. The two outer or exhaust cam-levers are journaled to arms projecting from the engine bed, so that their free ends have an up-and-down movement, but no horizontal movement toward or from the cam-shaft. The movement of the exhaust-valves, therefore, is never altered.

The outer ends of the levers operating the inlet-valves are pivoted to the upper ends of arms rigidly secured to a shaft placed parallel with and outside of the cam-shaft, and having at its center a third arm, E, Fig. 4, which extends to and unites with the governor-rod. The governor, of the ball type, is driven by bevel gears from the cam-shaft, and its lower end is slotted to inclose the cam-shaft and extend to the arm E. It is evident that

the raising and lowering of the governor-rod will partly turn the shaft carrying the arm and thereby move the cam-levers toward or from the valve-stems in a horizontal direction. The free ends of these levers are shaped as shown in Fig. 4, the under side of the lever being cut away on a curve directly over the cam. When the cam-lever is in the position shown in the left-hand cut of Fig. 4 it will not be lifted by the cam, which revolves in the direction of the hands of a watch. The governor-balls are now at their highest possible point. In the right-hand drawings of the same figure the governor-balls are shown at their lowest position, and the cam will now strike the shoulder of the lever and open the valves the longest possible time. The valves are seated by their own weight and by the action of springs arranged as shown in Fig. 1. All jarring of the valve at seating is prevented by the curved form of the shoulder on the cam-lever, which rides upon the cam and brings the valve gently to its seat.

An idea of the form of the steam-passages may be obtained from Fig. 2, which is a view of one of the steam-chests split vertically through the center of the valves, and the two parts opened as if on a hinge. D D' are the inlet and E E' the exhaust valves. The live-steam

planation are then press-copied, so that the many steps for years past can be ascertained by consulting the copying-books. The drawing then passes to the chief draftsman, who assigns the task of reproducing it to scale to one of his assistants. It is drawn upon white paper and inked in, and all necessary dimensions are marked on it. Although the drawing is made to scale, it is the rule to dimension all those parts the size of which the builder must know, and any information necessary to be given beyond the form and size is written near the drawing. The drawings of the machinery for the Calumet and Hecla Mining Company are so self-explanatory that no specifications accompany them.

The original sketch and the drawing on white paper are then passed to another draftsman, who makes a tracing on cloth of all on the first sheet. During his work he checks both the design and the dimensions, and is considerably more than a mere machine copying lines made by another. He must be able to read the drawing and be capable of detecting any error. The finished drawing before being sent to the shop is examined by the chief draftsman, another employee, so that from the first sketch it had passed through the hands of four men, all of whom understood

### Photographing Projectiles in Flight.

Lieut. Albert Gleaves and Ensign Stokely Morgan have succeeded in photographing a projectile in flight. In Austria last year Professor Anschuetz succeeded in getting a photograph of a rifle bullet, the projectile moving at the rate of 1300 feet a second, and the plate which he used for the purpose being exposed for only .000076 of a second. The two English officers named used a surface Hotchkiss rifle, weight of charge 70 grains, weight of lead bullet 405 grains, with an initial velocity of about 1400 feet a second. Professor Anschuetz, of Lissa, has succeeded in obtaining remarkable and interesting results in photographing the flight of cannon-balls from the moment of their projection to their striking the target or other object aimed at. He demonstrated the perfection of his studies on the trying grounds of the Gruson works, near Buckau. His plates were submitted to the expert, Dr. Koenig, of the Berlin University, who was perfectly able to make therefrom the desired practical calculations. He established the fact that the projectile thus photographed had a velocity of 400 meters a second and that the duration of the light thrown upon the photographic plate did not exceed the 10,000th part of a second.

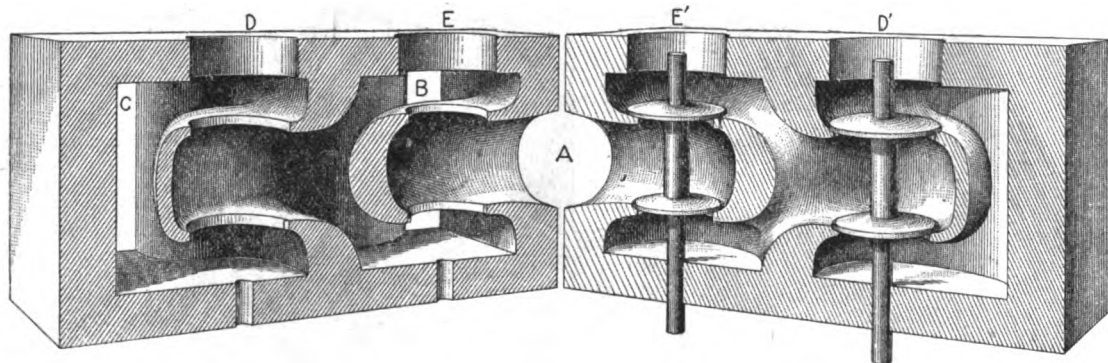


Fig. 2.—Steam-Passages of Putnam Engine Valves.

enters at C from a passage cored in the side of the cylinder and leading to the supply-pipe, which is placed between the valve-chests. Upon the lifting of the valve D D' the steam enters the cylinder through the port B. The exhaust is made through the port B and opening A when the valve E E' is lifted.

### The Leavitt Drawings.

The drawings made in the office of E. D. Leavitt are almost as well known as the machines they represent, and have earned an enviable reputation not only for the ideas they represent, but also for their accuracy and artistic finish. When it is stated that drawings for the machinery, the execution of which cost over \$4,000,000, were so near absolute perfection that less than \$2500 was paid for the errors in construction, an idea may be formed of the accuracy of the first conception and the faithfulness of the reproduction in metal. When, further than this, we remember that the apparatus made embodied new principles, was of proportions in many cases without precedent, and which made necessary new forms of construction, we respect the knowledge displayed in the first crude sketch and the skill shown in perfecting it.

The system by the aid of which this has been accomplished in the office of E. D. Leavitt is remarkable mainly because of its simplicity—there is nothing cumbersome about it. The several parts of a new machine are sketched by Mr. Leavitt and described. The drawing and its ex-

it and all of whom vouched for its accuracy. Mr. Leavitt never assumes any responsibility concerning the drawings. He gives all the necessary data and then throws the responsibility into the office. Of course he is responsible for the proper working of the machine, but as one has never yet failed to perform what was expected of it, his burden is light.

The first drawing is made on white paper, mounted on linen stretched on a board a little larger than the sheet, which measures 40 x 26 inches. The sheet is not removed from the board until the drawing has been completed, and if from any cause work upon any drawing ceases, it is labeled and placed in the safe. All drawings finished are placed in a fire-proof vault, those relating to the same machine being kept together in a drawer just large enough to easily admit the sheets. All those mounted, upon which work has been for a time abandoned, stand in racks made just large enough to admit them, and in similar racks all the drawings which have been worked upon during the day are placed; at night either the white-paper drawing or the tracing is always kept in the office, and a record is kept showing the disposition of all copies, such as blueprints.

During the building of a machine an inspector, appointed by Mr. Leavitt, is stationed at the works. He sees that the work done conforms to the requirements of the drawings and from time to time reports. In case of dispute between the inspector and builder the case is referred to Mr. Leavitt, who makes a personal examination and decides the case.

The theory of the motion of projectiles is a subject regarding which volumes have been written. An Austrian chemist named Mash has photographed a number of rifle bullets while in motion by means of the electric light, and thus presented some remarkable phenomena. In this operation his plan is to illumine the bullet by letting it break an electric current, but the velocity of the bullet must exceed that of sound in order that the conditions of the air before and behind the projectile can be shown. After various experiments Mash succeeded in his efforts to photograph projectiles fired from Werndl and Guedes rifles having respectively an initial velocity of 438 and 530 meters per second. The photographs obtained in this manner showed an air formation in front of the bullet having the form of an hyperbola, while behind it almost a vacuum was formed in which, when the initial velocity was great, there were some curious spiral motions. From the description given there appeared from these photographs to be a great similarity between the motion of a body through the water and that of a projectile through the air. A use of photography is to make a cannon-ball take a picture of its own wabbings. An arrangement something like a camera is placed in the forward end of a bolt projectile, and when it is fired directly at the sun the light traces lines upon the exposed sensitive plate, from the direction of which experts can afterward tell whether the projectile kept "end on," has "upset," or has kept in one position or wavered to and fro during its flight.



### The Pullman Shops.

The unsatisfactory condition of manufacturing establishments which depend upon railroad patronage is well shown in a recent statement published concerning the Pullman shops at Pullman, near Chicago. This report says that among the cabinet-makers and carvers there are usually from 400 to 500 at work, while now there are not over 200. There are less than 80 in the foundry, while there ought to be 700. No work is being done in the steel mill, and 300 men are idle, but it is expected enough work will be on hand in this department in a few days to last a month. There are 150 men in the iron department, while usually there are 500 or 600 at work. In the freight shops only 40 out of 400 or

concerns as the Pullman company, while some of the merchants and men say things have been getting worse from week to week.

### Drifting Test for Steel Angle-Bars.

A drifting test of the toughness of medium steel for structural purposes, recently devised by Hunt & Clapp, of the Pittsburgh Testing Laboratory, has been found to be one of the most effective of the usual tests for ascertaining the quality of the metal. The angle experimented upon measured  $6 \times 4 \times \frac{1}{4}$  inch and gave the following results when tested in an Olsen machine: The test consisted in punching  $\frac{1}{4}$ -inch holes 2 inches from the edge of the angle and 8 inches between centers, and

dication of how the metal will behave under other than tensile and compressive strains. Rails, for example, are now bought and sold absolutely without an effective test for their real wearing qualities. We have often stated, and now repeat, that the real tests which it is desirable to establish for rails are, first, a wearing test under abrasion; second, a deformation test under impacts of heavy loads at very low velocities; third (and this is the only test for rails now practiced which sheds any real light on their quality), breaking tests under impact. All chemical and mechanical tests other than this merely serve the negative use of excluding exceedingly bad rails. They do not show whether a rail of fairly good metal will wear well or ill in service, but

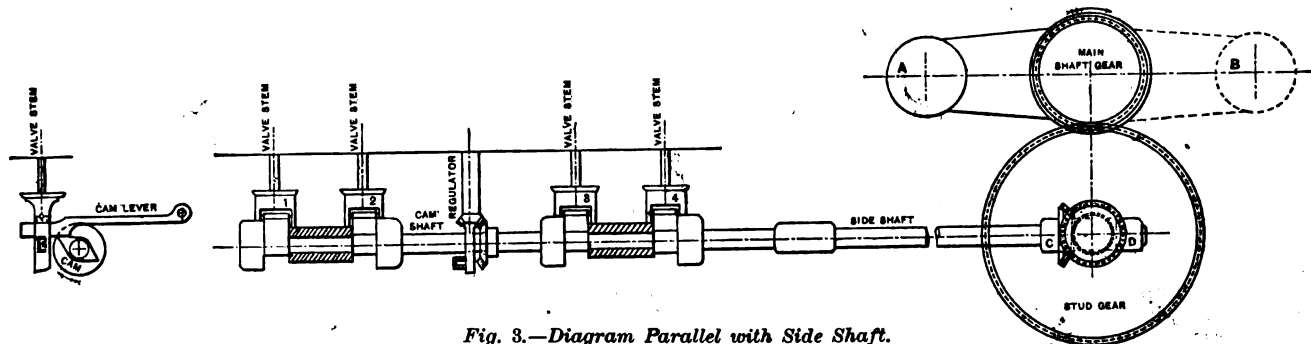


Fig. 3.—Diagram Parallel with Side Shaft.

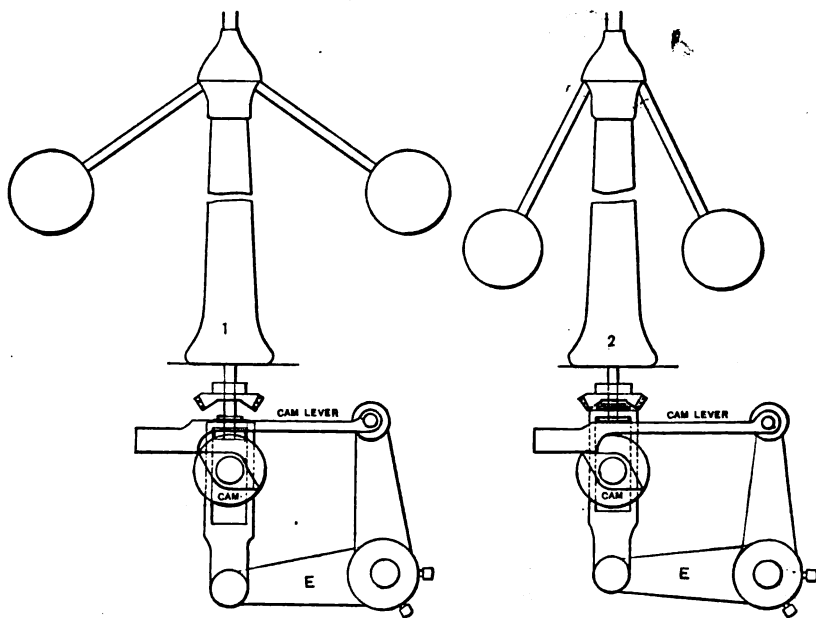


Fig. 4.—Governor and Cams.

500 are at work, and these are just finishing up a few caboose cars. Work in this department is slack because of a lack of material and because a new Corliss engine is being put in place. In the store-room the force has not been cut down, but the wages have. The men who received \$1.50 per day now get \$1.25, and the chief store-keeper's salary has been cut from \$150 to \$120 per month. Less than 100 men are now working in the lumber-yard, where the regular force is from 240 to 250. The helpers of the steam-fitters have been cut from \$1.50 per day to \$1.25 per day, and over a dozen have left their work. Some 25 men were laid off from repair-work on the 8th inst. The wood machine department was closed down week before last, and unless more work is forthcoming the claim is made that but very few men will be employed in the Pullman shops in a short time. The officials say it is only temporary and nothing unusual with such

then enlarging the holes to an average of  $1\frac{1}{4}$  inches by the blows of a sledge on a drift pin. In good quality of steel the edges of the holes were found to be sound throughout, while the flow of the metal was plainly indicated. The test is an inexpensive one, and, in the opinion of Hunt & Clapp, is a very satisfactory one. They now use it regularly on all steel which is to be riveted up without reaming, and also in other cases where they wish to demonstrate the qualities of individual bars. It is found that metal which is short or burned or which is too hard chemically will fail under this test. In an article upon this test *Engineering News* says: This test is precisely in the line of a too-limited list of others which substitute a test somewhat approximating the actual destructive strains of service for the bare tension and compression tests, which are all right for the members or parts of members exposed to like strains in service, but which give no absolute in-

rather often indicate directly wrong conclusions.

Another test of this practical nature, which we may mention for illustration, is Mr. M. Wilder's bending test for stay-bolt iron. Finding the ordinary tests gave no direct evidence whether stay-bolt iron would prove good or bad, and reasoning that stay-bolt fractures resulted from bending due to expansion and contraction until the bolt was broken off, as one might break a piece of wire in his fingers, it occurred to Mr. Wilder to imitate these strains exactly. A piece to be tested,  $2\frac{1}{4}$  to 3 feet long, was fixed in a vise, and a piece of pipe slipped over it to give a grip, leaving about 6 inches bare next to the vise. Two men then walked around with the end of the pipe until the test piece was bent to a right angle, when they walked back again, and bent it to a right angle the other way. The quality was judged by the number of complete right-angle bends which it was possible to form without fracture, which varied from 4 to 16 in  $\frac{1}{4}$ -inch iron sold as good stay-bolt metal, although the same lot would vary only two or three bends. A stipulation that all metal accepted must stand 12 bends resulted in a very speedy improvement in the quality of the metal, and gave the manufacturers a definite criterion, which greatly aided them also by enabling them to determine just what was necessary to fill the requirements. Until consumers determine such standards as this it is quite idle to expect manufacturers to fulfill their expectations. They do not know how to do so, in the first place; and as the consumer will not give them credit for it, in the second place, for lack of a standard of comparison, but will probably buy some other iron  $\frac{1}{2}$  cent per pound cheaper, why should they take the trouble?

The plant of the Susquehanna Iron Company, at Columbia, Pa., which has been idle for some weeks on account of a strike of the puddlers, partially resumed operations on the morning of the 6th inst. The old employees were offered their positions, but refused to accept them. The company expect to have the mill in full operation in a few days.

### The Boulton Apparatus for Compressing Steel.\*

The Billings process for compressing steel ingots was intended to apply the pressure instantly when the casting was formed, but operated only to lock the gases within the ingot. In experiments tried by William R. Hinsdale, at the Jersey City Steel Works, in the year 1884, it was found that a pressure of 300 pounds per square inch, operating upon a 24-inch piston, and concentrated upon the end of a 3½-inch-square ingot, merely produced an ingot containing innumerable globules of gas. If the pressure was deferred until the ingot slightly hardened a pipe would form in the ingot at the upper end, and would remain permanently, as the hardening would prevent the pressure from operating effectively. The Billings and Hinsdale process provided a reservoir at the top of the mold and a movable plunger within the mold, by which the steel was drawn downward to make an ingot, which would be fed, during the shrinkage period, by the residue remaining in the reservoir. This process is not, therefore, convenient, except for the casting of large ingots. Mr. Hinsdale also experimented at the Jersey City Steel Works with a pressure of 60,000 pounds per square inch upon the metal applied to the end of a 3½-inch-square ingot—nearly double the pressure ever applied by Sir Joseph Whitworth. The result was the shortening of the ingot from 25 to 22 inches in length, and perfect solidity, except that the pipe appeared in the same form, a flaw, as it ordinarily displays itself at the piped end of a forged bar. Mr. Hinsdale thus found that piping or its effects could not be eliminated by pressure, and invented a perforated plug to insert in the mold upon the top of the fluid metal, through the perforation in which the gases might escape while applying the pressure. With this device the top of the ingot became slightly chilled and a crust formed thereon; but after the pressure upon the metal was raised to about 20,000 pounds per square inch the crust of metal exploded with a loud report, and a circular piece like a boiler-punching shot out of the perforation in the plunger, followed by the gas and sufficient metal to fill the cavity and form a stud as long as one's little finger on the top of the ingot.

This process produced ingots absolutely solid and free from defect, which had been proved impossible by the mere use of pressure. The expense of all these methods and the inconvenience of applying them to the open ingot molds universally used for casting steel ingots resulted in the invention, by Mr. J. B. D'A. Boulton, of Jersey City, N. J., of an apparatus in which ingot molds made without bottom, but in other respects like the common ingot molds, are superposed one part upon another and successively filled, the shrinkage in each ingot being fed by the fluid metal in that above it, and the resulting product being a series of absolutely sound ingots connected by cold-shut joints. An ingot made by this process and split open has been shown to be perfectly sound. By interposing an asbestos washer with a small aperture between the successive mold sections the resulting product was necked at intervals, so that the ingot bar could be readily broken at such points.

Boulton's apparatus, now manufactured by the Solid Ingot Company, of Jersey City, N. J., is shown in Figs. 1 to 8, inclusive, Fig. 1 representing the apparatus mounted over a pit, with a hydraulic elevator to raise the ingots to the floor level; Fig. 2, a vertical section through the cyl-

inder D in Fig. 1, and the parts above it; Fig. 3, an elevation of the elevator at right angles to that shown in Fig. 1; Fig. 4, a longitudinal section on the center line of Fig. 3; Fig. 5, a transverse section on line *xx* in Fig. 4; Fig. 6, a plan or end view of the elevator; Fig. 7, a plan of one mold; and Fig. 8, a side view of the same showing notches *k* and *j*, by means of which the mold is propelled through the casting machine and the elevator. The apparatus consists in a spring holder made of two I beams, A A, pressed together by tie-bolts, *m*, provided with springs, B (2). Hydraulic cylinders, I, are provided with piston-rods, *i*, to actuate a cross-head, *h*, which encircles the top of the holder and is provided with pawls, *a*, Fig. 1, adapted to fit the notches *i* in the sides of the

thus forcing the filled mold further down in the holder. When several molds have been filled, the first contained in the pocket *e* is shifted transversely by reciprocating the piston *f f'*; and the pocket being restored to a line with the holder, the subsequent downward movement of the molds within the holder discharges the severed mold and its contained ingot from the machine.

The hydraulic pistons are governed by valves shifted by hand levers not shown in the drawing, and the motions of the several parts are thus effected with great ease and rapidity. In practice a cycle of the required movement can be performed in much less than a minute, while it is found that such an interval is required to fill each mold and cool the ingot the de-

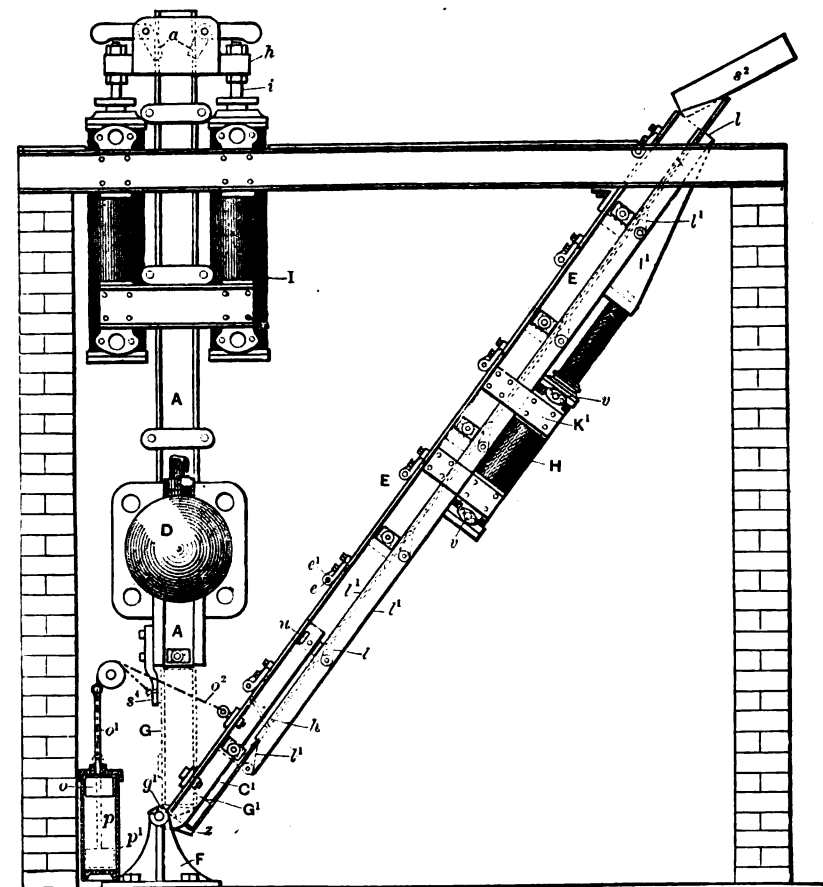


Fig. 1.—Mounted Over Pit with Elevator.

### THE BOULTON APPARATUS FOR COMPRESSING STEEL.

molds. A transverse cylinder (D, Fig. 1; *f f'*, Fig. 2) is applied to the bottom of the holder, and contains a piston, *f f'*, Fig. 2, provided with a pocket, *e*, to receive the molds in succession as they are forced downward in the holder. A spring dog, *e'*, sustains the weight of the mold and its contents in the pocket, while the piston is moved laterally, as shown in Fig. 2, and the ingot, while still red-hot, is thus sheared off at the joint of two molds. A spring tongue, *s'*, is used to set the molds in the holder, and the lifting of the head *h* separates the extremities of the tongs and detaches them from the mold. After the pawls *a* have engaged the notches *k* the head is moved downward and forces the mold within the holder into position for filling, as shown in Fig. 4. The apparatus is used by first inserting in the top of the holder a mold with a bottom (like that at *b* in the pocket *e* in Fig. 2). When filled another mold is superposed in like manner, and the head *h* and pawls, *a*, again reciprocated to draw it downward,

sired degree by the time they reach the sharing pocket *e*.

The molds being formed in longitudinal halves, as shown in Figs. 7 and 8, are readily separated from the castings, which, owing to the perfect feeding of the shrinkage in the progress of the molds through the machine, are absolutely sound and free from piping, and the cast steel is of high density throughout. The gases are also fully discharged from the fluid metal, as their free escape from the top of the metal is always possible. In most instances the machine may be set at such a level as to discharge the ingots at a convenient point for subsequent work; but where it is desirable to raise the ingots to the level of the casting-floor the elevator shown in the figures may be used. The elevator is arranged in an inclined position, with its lower end beneath the casting machine, to receive the molds and their contents and to intermittently raise the same through a guide, E, Fig. 1, to discharge the molds *s'* at the top. This is

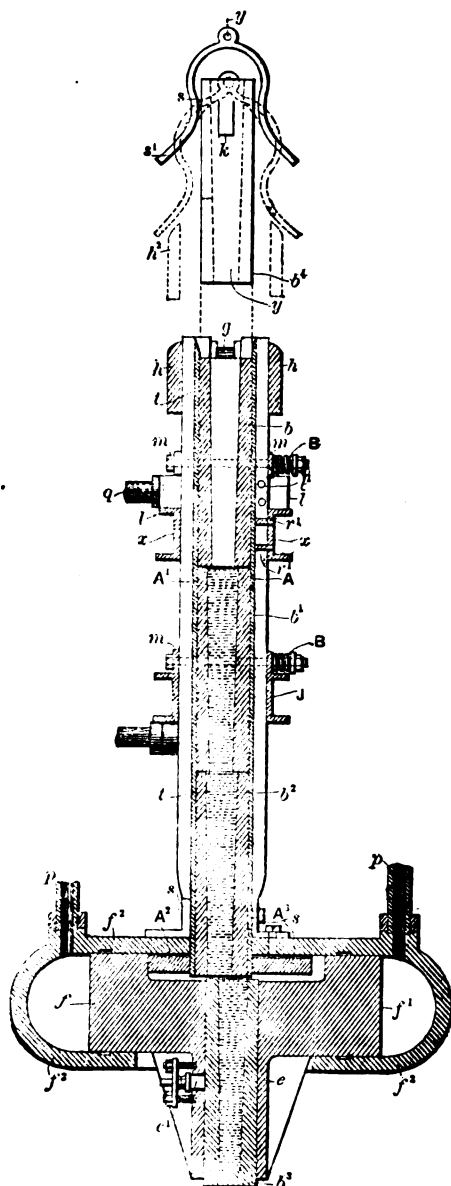
\* From a paper entitled "The Piping of Steel Ingots," read by T. S. Crane, of Newark, N. J., at the Erie meeting of the American Society of Mechanical Engineers.

effected by providing a box, G, pivoted at one side and held vertical when empty by a counterbalance weight, *p*, operating in a dash-pot, *o*. The entrance of the mold into the box G tips the box over into the guide E, which is provided with a ladder-like frame, *F*, carrying a series of pawls, *L*.

works of Messrs. Spaulding & Jennings since December, 1887, and one ingot per minute is cast in it regularly when the heat is ready. The ingots cast are nearly 4 inches square and are absolutely sound, but the machine is equally adapted to cast larger ingots by making the holder and

**Ohio Mechanics' Institute.**

We are indebted to James Allison, director Ohio Mechanics' Institute, of Cincinnati, for a copy of the 61st annual report of the Board of Directors of that institution. Perhaps the most interesting



**Fig. 2.**

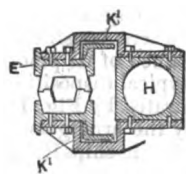
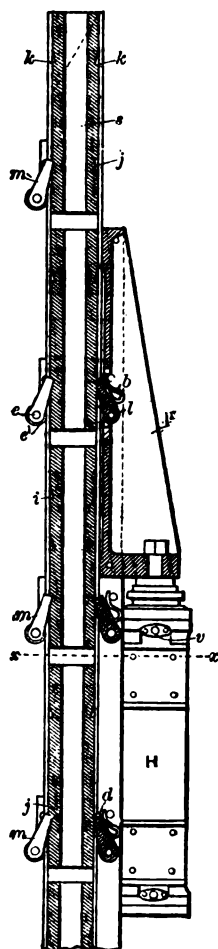
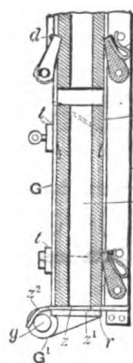


Fig. 5.



**Fig. 4.**



**Fig. 4.**

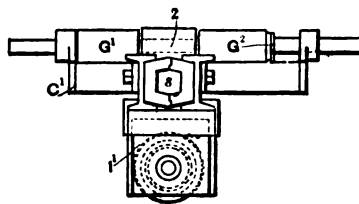


Fig. 7.

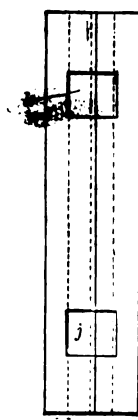
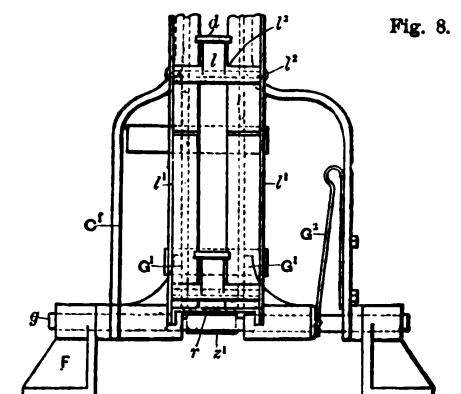


Fig. 8.



**Fig. 3.**

**Fig. 2.**—Vertical Section through Cylinder D, Fig. 1. **Fig. 3.**—Elevation of Elevator. **Fig. 4.**—Longitudinal Section on Center Line, Fig. 3. **Fig. 5.**—Transverse Section on Line *xx*, Fig. 4. **Fig. 7.**—Plan of Mold. **Fig. 8.**—Side View of Mold.

## THE BOULTON APPARATUS FOR COMPRESSING STEEL.

The ladder is reciprocated by the hydraulic cylinder H, and operates to push the molds intermittently upward within the holder. Pawls, *m*, are provided to hold molds, when the ladder *l* is moved downward for the pawls *l* to engage another mold.

Boulton's apparatus has been in commercial operation at the West Bergen steel

the ingot molds of suitable dimensions. One man suffices to operate the levers of the hydraulic apparatus, and the ordinary operators are employed to pour the metal. The whole operation of forming the ingots is so similar to the use of ordinary molds that no training is needed to use the machine, and it may therefore be regarded as practically perfect.

portion of this report relates to the progress of the industrial and art schools connected with the institute. There are three departments to this school, the mechanical department, architectural department and artistic department, the first having 176 members, the second 148 members and the third 183 members. In the mechanical department students are

instructed in studies relating to the work of machinists, metal workers, foundrymen, blacksmiths, pattern-makers, &c. The architectural department is designed especially for carpenters, joiners, builders, masons, bricklayers, &c., while the

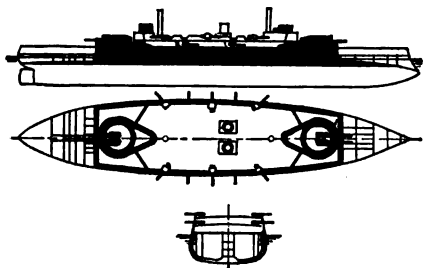


Fig. 1.—New Turret Ship.—Design.

artistic department is for instructions in drawing, painting, carving, silver-smithing, ornamental ironworking, decorating, &c. Instruction is given in each department two evenings a week, from 7 until 9 o'clock. We understand the instruction is given free of charge, all the pupil has to provide being the necessary materials and instruments for use in the classes. This school, in connection with the Ohio Mechanics' Institute, is comparatively little known, but from what we have heard it deserves a far wider publicity. The work done in the past has been most excellent, and the school offers many facilities for

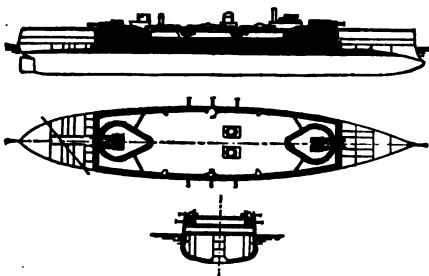


Fig. 2.—New Barbette Ship.—Design.

instruction for persons residing in the neighborhood of Cincinnati. For the benefit of those who may care to learn further about this institute we will state that the secretary is William H. Stewart, 305 Plum street, Cincinnati, Ohio.

#### Designs for New English Battle-Ships.

The first paper read at the late meetings of the Institution of Naval Architects of Great Britain was "On the Designs for the New Battle-Ships," by

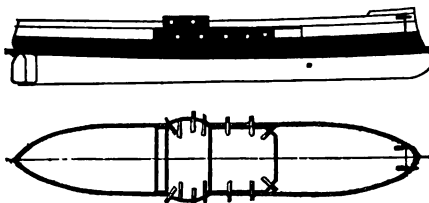
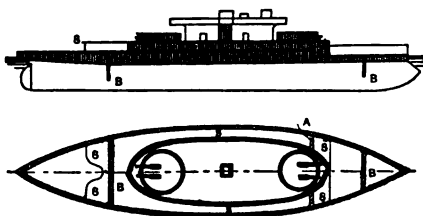


Fig. 3.—Sultan.

W. H. White, F.R.S., Assistant Controller of the Navy and Director of Naval Construction. The paper, which we condense below, describes the main features of the approved designs for the eight first-class battle-ships which are proposed to be added to the navy, and contrasts their protection, armament, speed and

coal endurance with the corresponding features of other battle-ships designed during the last 20 years. The information presented may be considered accurate and authoritative, as the author obtained permission from the First Lord of the Admiralty to prepare the paper.

Two designs have been prepared and approved by the Board of Admiralty, and in both are embodied identical qualities, so far as relates to the disposition (in plan) of the armament; the number and caliber of the heavy guns; the nature, disposition and protection of the auxiliary armament; the distribution and thickness of the hull armor; the propelling machinery, speed and coal supply; the complement and equipment; magazines and transport of ammunition, and arrangement for hold stowage. In principal dimensions and displacement the two types are identical. The essential differences



A is bulkhead from breastwork to ship's side. B B are bulkheads added during construction. S S is superstructure added during construction.

Fig. 4.—Devastation.

are that while one design is for a turret ship with moderate free-board at the extremities, and with guns about 17 feet above water, the other is for a barbette ship with the guns carried about 6 feet higher, and with high free-board at the bow and stern.

The board took into consideration all the principal dispositions of armament adopted in recent years for battle-ships, as well as several proposals that have been made—some of which have been patented—but not yet carried out in practice. It may be of interest and assistance in the discussion if I briefly summarize and illustrate some of the more important of these arrangements, and for this purpose a series of dia-

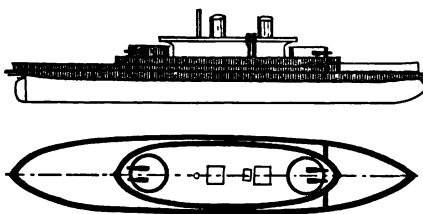


Fig. 5.—Fury.

grams—Figs. 3 to 16—have been prepared. On these diagrams the arrangement of the armor is also indicated. Fig. 3 shows the disposition of the armament of the Sultan, designed in 1868. Practically the whole of the armament is contained in a central two-storied battery placed amidships, and associated with a water-line belt of armor. Other illustrations of the "belt and battery system" need not be given, as it is well known. Figs. 4 and 5 show respectively the arrangements carried out in the "breastwork monitors" Devastation and Thunderer, designed in 1869 and proposed for the Fury in 1870. Here a low free-board is adopted for the greater part of the length; and the two turrets, each containing two guns, are placed at the ends of the armored breastwork, which is of less breadth than the ship. This design for the Fury was canceled, and work upon the ship stopped at an early stage. The vessel was entirely re-designed in 1872—

see Mr. Barnaby's paper in *Transactions* for 1873—and became the Dreadnaught, which is illustrated in Fig. 6. In all these designs the disposition of the armament is identical, and in securing the "all-around fire" of the turret guns it was made practically impossible to carry any effective secondary armament. Fig. 7

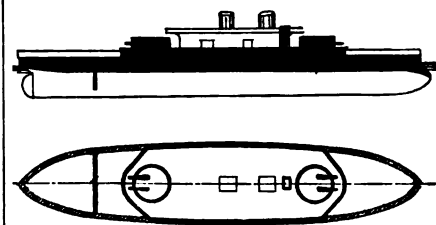


Fig. 6.—Dreadnaught.

shows the Inflexible, a central citadel ship, with turrets placed *en échelon*. In some of the later ships of this type an endeavor has been made to carry a few 6-inch guns as well as light quick-firers on the super structures; but, as in the previous disposition, the means taken to secure large arcs of command for the heavy guns reduced greatly the efficiency of the secondary armament. Fig. 8 illustrates the arrangements of the Italian citadel-turret ships Duilio and Dandolo, and Fig. 9 those of the German citadel-barbette ships of the Sachsen class. During the period 1869-78 very little was done in the designs of H. M. ships in the direction of providing for a numerous and effective secondary armament, but this was not true in foreign

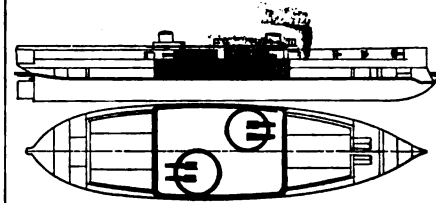


Fig. 7.—Inflexible.

navies, and particularly in the French Navy. Figs. 10 and 11 show the principal features in the disposition of armament in a large proportion of the French battle-ships. There are four protected stations, each containing a heavy gun with a large arc of training. At a lower level are placed a number of guns of moderate caliber, sheltered to some extent from the fire of the heavy guns. A very similar arrangement to Fig. 11 has been adopted in the Imperieuse and Warspite of the Royal Navy, where considerable experience has been gained of its practical working. Another typical disposition of the armament is illustrated by Fig. 12, which represents broadly the arrangements adopted in the Italian battle-ships Italia and Lepanto. Here

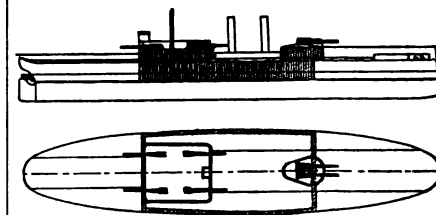


Fig. 8.—Sachsen Class.

the four heavy guns are carried *en barbette*, high above the water, at the ends of a single armored inclosure placed near the middle of the length of the ship; nearly the whole upper deck forming a glacis, over which these guns fire if the, full arcs of training are obtained. The auxiliary ar-



mament is chiefly carried on the main deck, and sheltered by the upper deck from the fire of the heavy guns. It will be remembered that in the design for an American battle-ship, described by Mr. John in a paper read before the institution last year, a somewhat similar disposition of the armored battery or citadel was adopted,

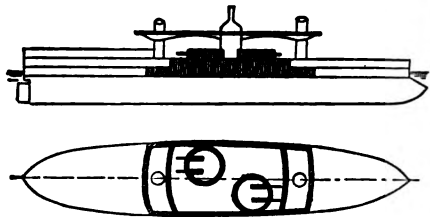


Fig. 9.—Duilio and Dandolo.

but in association with turrets, and with a different arrangement of the auxiliary armament and upper works. Fig. 13 represents the Russian battle ship Catherine II. In this case the battery is of large extent, and at each end of the corners pairs of heavy guns are mounted *en barbette* on the disappearing principle. The upper deck is a glacis for their fire, and the auxiliary armament is placed below this deck. Fig. 14 represents the disposition

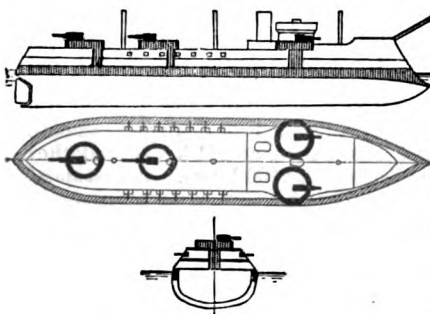


Fig. 10.—Admiral Duperre.

of armament in the Admiral class. Here the secondary armament is greatly developed and mainly carried in a central battery between the two protected stations containing the four heavy guns. Fig. 15 illustrates the very similar arrangements—in plan—adopted in the Nile and Trafalgar. It will be seen that in these vessels the central battery is shorter, and the secondary armament less numerous than in the Admirals. Fig. 16 illustrates one

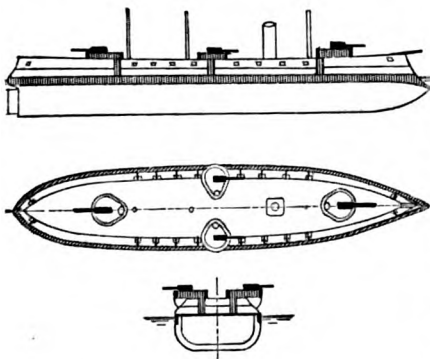


Fig. 11.—Magenta Class.

of the various arrangements proposed by Sir Edward Reed, but not adopted, I believe, in any ship yet built.

After careful consideration of these and other alternative arrangements the board laid down the following principles for the new designs: 1. That there should be four heavy guns placed in two protected stations, situated at a considerable distance

apart, each pair of guns having an arc of training of about  $260^\circ$ , equally divided on each side of the line of keel. All four of these guns to be available on each broadside. 2. That the greater portion of the auxiliary—or secondary—armament should be placed in a long, central battery, situated between the two heavy-gun stations, and so disposed that there should be practically no interference with the fire of any one gun by that of any another. 3. That in view of the development of high explosives, it was desirable to secure the widest possible distribution of the guns in the auxiliary armament, and that it was preferable to mount the auxiliary armament on two decks, one of them being the spar deck, rather than to carry the guns chiefly between decks. It has been decided that each ship shall carry four  $13\frac{1}{2}$ -inch 67-ton guns as the principal armament, with

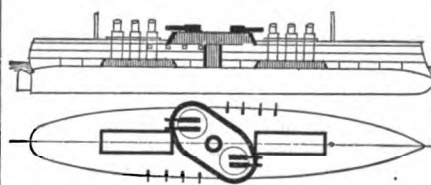


Fig. 12.—Italia and Lepanto.

hydraulic apparatus for training, elevating and loading the guns. The grounds for this decision are stated as follows: The height of the turret guns above water in the Trafalgar as designed was 15 feet; in the new turret ship it will be 17 feet. With the thick armor used for the protection of turrets and turret bases this apparently small change in the height of the guns above water involves an additional weight exceeding 150 tons. In the barbette ships the heavy guns will be 23 feet above water.

While the heavy-gun armament is practically identical with that of preceding ships, the auxiliary armament is of un-

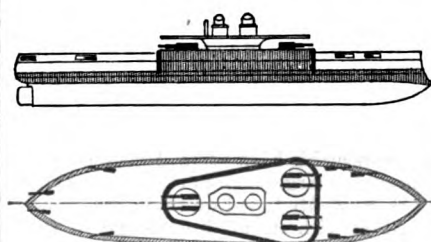


Fig. 13.—Sinope Class.

precedented weight and power. The new battle-ships are each to carry ten 6-inch 100-pounders, besides a considerable number of smaller quick-firers. The 6-inch quick-firing gun is still in the experimental stage; it will be adopted in these ships if successfully worked out, and weight has been taken for it. So far as weights are concerned, these ten 6-inch guns, with their mountings and ammunition, represent no less than 20 guns of the same caliber with the allowance of ammunition hitherto carried. The total weight of the auxiliary armament in the new ships is about 500 tons, or considerably over three times the weight originally assigned to the corresponding armament in the Trafalgar, and two and two-third times as great as the weight of the auxiliary armament to be actually carried by that ship. The weight of the auxiliary armament in the new battle-ships is practically equal to the total weight of armament proposed for the Fury design in 1870, the latter ship being of nearly 10,500 tons displacement.

The armor protection of the hull proper includes two principal features: 1. A

belt  $8\frac{1}{2}$  feet broad extending over two-thirds the length of the vessel, and having a maximum thickness of 18-inch armor. Transverse armored bulkheads complete the belt; a 3-inch steel deck is fitted above it, and a strong protective under-water deck completes the protection before and abaft the belt. 2. The broadside above

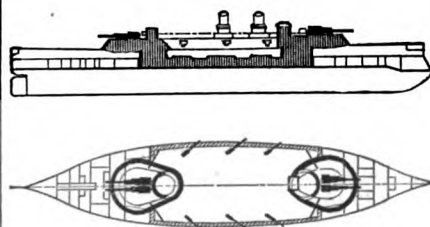


Fig. 14.—Collingwood.

the thick belt is protected to a height of about  $9\frac{1}{2}$  feet above water over a considerable portion of the length by 5-inch armor. Screen bulkheads, similarly armored, inclose the central battery. The protection of the heavy guns consists of 18-inch armor on the turrets, and 17 inches on the redoubts protecting the turret bases, &c. The illustrations in Fig. 1 will make this description clearer. It will be seen that each turret stands in a separate battery or redoubt, which rests upon the protective deck, and is strongly armored for the de-

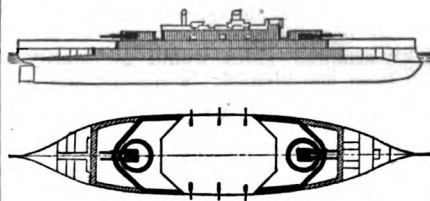


Fig. 15.—Nile and Trafalgar.

fense of the turret bases and loading apparatus. This system has been previously carried out in the Victoria and Sans Pareil, in each of which there is only one turret. The belt armor rises 3 feet above water and extends  $5\frac{1}{2}$  feet below water. Its longitudinal extent is sufficient to insure that if the spaces before and abaft it and above the under-water protective deck were flooded very small "sinkage" and very moderate "change of trim" would ensue. The maximum thickness of the belt armor is 18 inches, as against a maximum of 20 inches in the Trafalgar; the minimum thickness at the ends of the belt is the same as in the Trafalgar—14 inches. The proportion of the length protected by the belt is

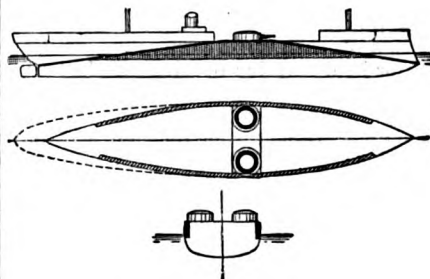


Fig. 16.—Sir E. J. Reed's Design.

the same in both cases. Above this thick armor belt and protective deck the broadside is armored with 5-inch steel for a length of 145 feet, and to the height of the upper deck amidships ( $9\frac{1}{2}$  feet above water). Oblique armored bulkheads or screens extend across the protective deck and meet the redoubt armor, thus com-

pletely inclosing a high armored citadel with its top at the level of the upper deck (9½ feet above water), having the same extreme length as the central battery, viz., 170 feet. Within the 5-inch steel armor on the sides coal bunkers are built, extending from the belt to the upper deck, and having an athwartship thickness of 10½ feet. When filled with coal these bunkers would greatly re-enforce the defense; when empty, the minimum defense is 5 inches of steel, which is proof against all the smaller kinds of quick-firing guns and against many of the most destructive forms of attack from much larger guns. In the Trafalgar the two "turrets stand at the ends of a long armored citadel extending to the full breadth of the ship, with vertical armor on the sides (varying in thickness from 16 inches to 18 inches) rising to a height of about 11 feet above water," according to the original design. In the completed ship this height will be about 10 feet. The upper deck over the citadel is plated with 8-inch steel. The distance between the centers of the two turrets is about 150 feet, and the central battery between the two turrets has an extreme length of less than 110 feet and a length along the broadside of about 65 feet. In the new turret ship it has been necessary to provide a much longer central battery (about 170 feet in extreme length) to accommodate the more numerous and powerful guns in the auxiliary armament; and the turrets are placed about 200 feet apart. Consequently, if the citadel system embodied in the Trafalgar had been repeated the length of the thickly-armored sides would necessarily have been considerably increased; and a great additional weight and cost of armor, &c., would have been incurred if the same thickness had been maintained, or a considerable thinning of the armor, &c., made necessary if the same total weight had been adhered to. No point in the new designs received more careful consideration than this. In order to elucidate the matter, alternative designs were prepared for ships of the same displacement, identical in all respects except as regards the adoption of the "citadel" or the "separated redoubt" systems. With separate redoubts, placed far apart, the two stations are isolated, and there is practically no risk of simultaneous disablement by the explosion of shells or perforation of projectiles from the heaviest guns. Each redoubt offers a small target to the fire of an enemy, and its weakest part—the thick steel protective plating on the top—is of so small extent that the chance of its being struck is extremely remote. Serious damage to the unarmored turret bases, therefore, involves the perforation of the thick vertical armor on the redoubts.

With a single citadel extending the full breadth of a ship the case is widely different. Over a comparatively large area of the protective deck plating in the neighborhood of each turret perforation of the deck or its disruption by shell explosions at any point involves very serious risk of damage to the turret bases and the loading apparatus. In fact, such damage may be effected and the heavy guns put out of action while the thick vertical armor on the citadel is uninjured. Moreover, as the turrets stand at the ends of a single citadel, there is a possibility of their simultaneous disablement by the explosion of heavy shells within the citadel. This last risk may be minimized (as in the Nile and Trafalgar) by constructing armored "traverses" within the citadel, but it cannot be wholly overcome so long as both turrets stand in one armored inclosure. It may be thought that the risk of damage to a 3-inch steel deck situated 11 feet above water is remote; but I think the facts are as stated, when actions at sea are taken into account. For example, if a ship of 70 feet to 75 feet

beam is rolling only to 10° from the vertical, which is by no means a heavy roll, she presents a target having a vertical (projected) height of 13 feet to 14 feet to an enemy's fire, and even if she is a steady, slow-moving ship she will do this four or five times in each minute. Now, at this angle of inclination, assuming the flight of projectiles to be practically horizontal, even the thickest protective steel decks yet fitted in battle-ships are liable to serious damage from the fire of guns of moderate caliber, and this danger is increased by the employment of high explosives. Of course I do not mean to say that this damage is to follow from fire intentionally aimed at the protective deck; but with a great and sustained volume of fire, such as is possible with a powerful auxiliary armament, and especially with quick-firing guns, it is obvious that there is a very real danger of chance shots injuring seriously the wide expanse of the protective deck at the top of a long citadel. Again, it must be noted that the chances of damage to a deck placed 10 feet or 11 feet above water, and with large exposed surfaces in the neighborhood of the turrets when a ship is inclined or rolling, are greater far than those of a deck 7 feet or 8 feet lower, and with 5-inch armor on the sides protecting the deck from the direct impact of shells containing heavy bursters. It is for the naval gunners to estimate these chances of injury; but, unless I am greatly mistaken, their verdict will be that a far greater number of shots are likely to strike at a height of 8 feet to 10 feet above water than at a height of 4 feet to 5 feet.

I will now proceed to summarize the chief points of difference between the designs—see Figs. 1 and 2. In the barbette ships the free-board at the ends is increased to 18 feet, or 6½ feet more than the free-board in the turret ship, and about 7 feet 4 inches more than in the Trafalgar as completed. The heavy guns are carried 28 feet above water, as against 17 feet in the new turret ship, and about 15 feet as designed, or 14 feet as completed, in the Trafalgar. In the Royal Navy a very large proportion of our most recent and powerful ships are of moderate free-board, carrying their guns only 12 to 14 feet above water, whereas in foreign navies, in recent years, the heavy guns are chiefly carried from 22 to 28 feet above water, and the free-board is high. The decision of the admiralty to largely adopt the barbette design is avowedly based on these facts and arrived at with a full knowledge of the relative advantages and disadvantages of the turret and barbette systems, after considering designs for turret ships with guns placed at equal height above water, and with the same free-board as the barbette ship. It will be obvious that the increase in height of free-board and of guns above the water can only be secured by means of additional hull weights and rearrangements of the armor. What has been done is this: The turrets have been abolished, and the weight of armor, &c., is utilized in adding to the height of the redoubts in which the turret bases stand. The barbettes thus formed are strongly armored from the 3-inch protective deck above the belt upward, and are divided into two stories. In the upper story stand the turn-tables carrying the heavy guns; in the lower story will be placed the turning engines and other important portions of the equipment. The hydraulic system of mounting, working and loading the 67-ton barbette guns to be carried out in the new ships will resemble closely that already successfully adopted in the Admiral class. As regards the disposition of the belt armor, protective deck and 5-inch armor, as well as the protection of the auxiliary armaments, the barbette ships are identical with the turret design, already described.

It was originally contemplated to adhere in the new designs to the speed that had been first accepted for the Trafalgar—viz., 15 knots on the measured mile with natural draft and 16½ knots with forced draft. In working out the designs it has been found possible to increase these speeds to about 16 knots natural draft and 17½ knots with forced draft.

It was decided, after full consideration, that the new ships should ordinarily carry 900 tons of coal, as in the Trafalgar, and be capable of covering the same distance—viz., about 5000 knots at 10 knots. Like the Trafalgar, the new ships will have a bunker capacity sufficient to carry a much larger quantity of coal if desired. But whereas any increase above 900 tons in the coal put on board the Trafalgar necessitates an increased draft and some loss of speed, in the new designs provision is made—in the form of the so-called "board margin"—for an unappropriated weight exceeding 500 tons to be carried at the designed load draft and at the full speed. Strictly speaking, therefore, the case stands thus: Trafalgar, coal at load draft, 900 tons; new designs, coal at load draft and unappropriated weight, about 1400 tons. If the unappropriated weight should be assigned to coal it would give the new designs a coal endurance of nearly 8000 knots at 10 knots. Apart from any such increase in coal, however, the 900 tons proposed is a very large supply in relation to expenditure; larger, in fact, than that of nearly all first-class battle-ships. Take, for example, the Thunderer and Devastation as completed. They can cover about 4700 knots at 10 knots. Their full speed for continuous steaming in smooth water is estimated at 12½ knots, and they can cover about 2700 knots. At that speed with 900 tons of coal the new ships could cover about 3500 knots. At the highest speed contemplated for smooth water, continuous steaming—about 16 knots—the new ships could cover about 1900 knots. The forced-draft speed is never intended to be maintained for more than four to five hours continuously, so that an estimate of coal endurance under these conditions is worthless for any practical purpose.

	Length.	Mean draft.	Displacement.	Maximum speed.
	ft. in.	ft. in.	Tons.	Knots per hour
New ships, excluding board margin.	380 0	26 8	13,600	17½
Trafalgar, as designed.	345 0	27 6	12,000	16½
Inflexible.	320 0	25 3	11,880	13.8
Dreadnaught.	320 0	28 9	10,820	14.2
Minotaur.	400 0	28 9	10,600	14.4
Warrior.	380 0	28 9	9,210	14.1
		Extreme draft.		
Italia.	400 6	31 3	13,900	18
Lepanto.	400 6	30 9	13,550	18
Sicilia.	400 0	28 6	13,253	18
Admiral Baudin.	321 6	26 2	11,880	15

Before sitting down I will add two or three statements which appear to be of some importance when dealing with the relatively large size of the new ships. First, they have been shown to be made large by the great loads of armament equipment and board margin they carry on a moderate draft at high speed. Omitting the board margin—or allowance for contingent additions during construction—the ships are of 13,600 tons displacement and about 26 feet 8 inches mean load draft. I am not at liberty to make any statement respecting the admiralty estimate of cost for these ships, for reasons which will be obvious. But this I may say, that while the total weight of protective material in the new ships is greater than the corresponding total in the Trafalgar by something like 150 tons, the adoption of the 5-inch armor in association with redoubts, instead of a

central citadel thickly armored throughout, has the result of largely reducing the cost of the armor. This was not the reason, however, for the adoption of the system, as has already been explained. At the next meeting of the institution this question of cost may be debated on the basis of ascertained figures, and I therefore say no more.

## THE WEEK.

In 1886 there were three cities in Kansas with a population exceeding 15,000 each. At this time there are six cities varying in population from 15,000 to 50,000. In 1886 there were but 55 towns and cities exceeding in population 1000. At this time there are 107 cities and towns with a population of 1000 each.

Relative to steamship traffic between British Columbia and American Pacific ports, Captain Goodall, of San Francisco, agent of the Pacific Coast Steamship Company, states before the United States Senate Committee to Investigate Trade Relations with Canada that of the shipments north from San Francisco about 10 per cent. goes east by the Canadian Pacific, and about the same amount by the Northern Pacific. In his opinion the subsidized steamer lines of the Dominion Government will in time prove fatal to American lines unaided by the Government. British vessels cost fully 25 per cent. less to run than American vessels.

Secretary Tracy awarded to the Richmond Locomotive and Machine Works the contract for supplying the boilers and machinery of the battle-ship Texas, now building at the Norfolk Navy Yard. The price fixed in the contract is \$634,500. The Richmond bidders were in competition with some of the largest and oldest engineering works in New York, Philadelphia and Baltimore, and the contract was awarded to them after a careful inquiry which satisfied the Department of their ability to undertake a work of this magnitude. This action is in accordance with the Department's policy of enlarging the number of private establishments capable of building vessels and machinery, as well as of locating them in different sections of the country.

The introduction of flax culture on lands where wheat has ceased to be profitable is strenuously advocated by the Agricultural Department at Washington.

A new gas company, with a capital of \$800,000 is forming in Pittsburgh to run a pipe line to the Bellevue gas fields, for the supply of Oliver Brothers & Phillips' South Side Mills, the Republic Iron Works and Oliver & Roberts' Wire Mills.

In sinking a well for Spreckels' refinery at Philadelphia a copious flow of gas has been struck which Mr. Spreckels says will be worth \$2000 a day if the supply is sufficient.

An unseemly strife for the possession and occupancy of piers in New York City is renewed from year to year in the absence of specific laws relating thereto. The effort now is on the part of railroad corporations as against ship-owners in the China trade and others who have long occupied piers on the East River, to whom deep water alongside the wharves is indispensable. The shippers claim that enough short piers could be built below Grand street to accommodate the railroad companies, which only use shallow transports, without encroaching on their ancient prerogatives.

The Assembly ceiling scandal is followed by the report of an investigating committee, which states that there was a profit in the work of \$120,000, of which \$39,086.91 still remains in the Treasury. This leaves

\$80,000 in the hands of Snaith and Sullivan, the contractors. Investments aggregating \$26,000 being admitted by Sullivan and \$28,089.28 by Snaith, leaves to be accounted for only \$26,000, which the committee are satisfied was not disbursed on account of legitimate expenditures on the Capitol building.

The transcontinental mails between New York and the Pacific Coast are being transported in about 22 hours faster time than heretofore.

The Turkish Government is asked to consent to the invasion of Palestine by a locomotive railway, from the Mediterranean to Damascus, with the right of navigating Lake Galilee. The whole distance is 105 miles. "Fifteen minutes' stop at Jerusalem for refreshments!"

The Hamburg steamship Rugia, outward bound from this port with a cargo of cotton and lard, narrowly escaped destruction from fire, but was saved by forcing steam into the hold after the use of water seemed to be unavailing.

Throughout Florida the season has been several weeks behind the average, while at the North the spring has come early, and in the grain-growing regions far West the reversal of ordinary conditions is quite as noticeable as anywhere else.

Boston papers pronounce as ridiculous the attempt to boom the rubber market, intimating that it is only a device of speculators to get rid of their holdings, carried at a considerable loss.

The Government of Trinidad offers a subsidy of \$25,000 per annum for the establishment of a semi-monthly line of mail and fruit steamers between New York and Port of Spain.

General Brust, of Colorado, has purchased for a cattle company 140,000 acres from the Cherokee Nation for \$5000.

Minnesota millers say the recent rains in Dakota and Minnesota would have been cheap at \$1,000,000.

The New York Central Railroad Company propose to rebuild their grain elevator recently burned in this city.

In West Virginia, between Fairmont and Clarksburg, there are veins of coking-coal 6 feet thick. A railway connection will be made direct to Pittsburgh.

In consequence of the strike of about 70,000 German coal-miners many iron furnaces have been compelled to extinguish their fires. The Krupp Works have arranged to obtain coal from Upper Silesia and England and will resume the making of rails.

Caleb W. Mitchell has received from the Mexican Government a concession of land in several Northern States, permitting the establishment of several industrial and agricultural colonies, at the same time guaranteeing a bonus of 10 per cent. on the capital invested. The privileges include the erection of factories and workshops.

Surveys are making for a railroad from Pierre, Dak., to Puget Sound under the auspices of the Illinois Central, with the object of controlling the cattle trade. The line will run through the Sioux Reservation and the Yellowstone.

The directors of the Exposition Society of Pittsburgh awarded the contract for the erection of Machinery Hall to the Marshall Foundry and Construction Company for \$130,000, to be completed by September 1. The contractors for the main building are Murphy & Hamilton.

American trade relations with China are briefly touched upon in the annual review issued by the New York Chamber of Commerce. For nearly 100 years New York merchants have had friendly inter-

course with those of China, but there has been a change of late, and a feeling of alienation has gradually arisen. The report says the question of Chinese registration is delicate in many respects, but there is reason to hope that it will be finally solved in accord with the liberal spirit which the American Government has usually manifested in its dealings with foreign nations. If not, we must not be surprised to see this once profitable commerce pass from American and from British hands also into that of the German, with whom there cannot arise any such race conflict as the immigration of the Mongolian race has caused on the Pacific slope of the American continent.

The Illinois State Commissioners appointed to consider the expediency of manufacturing twine in the State prison estimate the consumption of twine in the State annually to exceed 4000 tons, costing about \$150,000 delivered.

Judge Barrett, of the Supreme Court, has decreed the dissolution of the bogus sugar-refining company and the forfeiture of its franchises.

The American Meat Company, of which Warner Miller is president, expect to supply New York and other Eastern markets with beef raised in New Mexico and slaughtered in Kansas City, in competition with beef from Chicago.

Ten beet-sugar factories to be erected in California will be supplied with machinery from workshops in that State, except a few pieces from Germany. The expenses of each factory will amount to at least \$100,000 a month, or a total of \$1,000,000 for the ten factories at the lowest calculations, exclusive of what they will have to pay to farmers for beets. The factories will produce 50,000 tons of sugar annually, which means the production of 500,000 tons of beets in that State.

Five large breweries, of which three are in Newark, one in this city and one in Albany, have been consolidated under a single management, with an aggregate capital of about \$5,000,000, to be represented by an issue of stock.

Charles George Wilson, the newly appointed Commissioner of Public Works, is the subject of much unenviable criticism by the newspaper press.

The residence of the late Joseph Sheffield, of New Haven, is about to pass into the possession of the Sheffield Scientific School.

With reference to numerous expected consular appointments by President Harrison, word comes from Washington that they will not be made hastily. The President, it is stated, is going to make personal investigation into the fitness of applicants for consular offices, in accordance with the policy which he outlined some time ago of reorganizing the service. It will be the policy of the President to put in consular offices men who can be of commercial advantage to their country abroad.

The new recitation hall for Yale College, now approaching completion, is architecturally the pride of New Haven. Fourteen huge Scotch granite columns adorn the entrance. The entire cost will be \$200,000, but who the benefactor is remains a mystery.

Thomas A. Edison brings suit to recover \$250,000, which in some way disappeared in a phonograph transaction, and which he claims to have lost. The defendants are E. T. Gilliland and John C. Tomlinson.

Ex-Consul Smith, of Carthage, says that the Republic of Colombia presents a vast field for American enterprise. Electric

lights, water-works, railways and ice machines are particularly wanted now, and the Government is liberally disposed.

The Brooklyn Bridge trustees voted to expend \$409,000 in extending and otherwise improving the New York terminal. The cost of changing the platform will be \$150,000.

A Rio paper says there is no doubt that the Brazilian Government, as an ally of Paraguay, is preparing to protect her against a threatened invasion by Bolivia, and that the cost may be very high.

It is estimated that 100,000 persons will go abroad this season, and if each individual takes but \$1000 the total will reach \$100,000,000, a sum large enough to have an important effect on our trade balances with foreign countries.

The Supreme Court at Washington, on Monday, affirmed the validity of the law excluding Chinese laborers known as the Scott Exclusion act. The case in which the decision was made is that of Chac Chang Ping, who left this country with a certificate entitling him to return, before the passage of the act. He has since attempted to land at San Francisco, and was refused admittance. The Supreme Court holds that Congress has the power to abrogate a treaty, and in support of that view cites the authorities of the courts on the subject, holding that the propriety of such action is not a matter for judicial cognizance, but that it is a matter for the political department. Congress, it says, has the power to exclude aliens from the country whose presence is deemed inimical to our interests.

Our Consul at Neuvo Laredo, Mexico, reports to the Department of State that the bridge across the Rio Grande, connecting Neuvo Laredo, Mexico, and Laredo, Tex., was completed on the 6th inst. and will greatly facilitate commerce between the United States and Mexico, and result in reduced rates of transportation.

The Spanish Exhibition will open on May 30.

It now appears probable that nearly all the governments invited to participate in the Congress of American Nations at Washington next autumn will be represented. The question of steamship subsidies is likely to be among the leading topics discussed.

It is announced that the Canadian Pacific road across Maine is practically completed, and will be opened late in June ready for business from British Columbia across the continent, and to Europe from Halifax.

Forty-seven hundred tons of sugar, valued at \$470,000, arrived at Boston 12th inst., brought by the steamship Shawmut, with a cargo of 12,700 bags, and the barge Atlas, with 16,000 bags, the latter taken in tow, from Matanzas, Cuba. The voyage was made in 11 days, and the two captains by whom this feat was accomplished claim that long-distance towing is practicable if suitable vessels are used.

New York State is now prepared to kill murderers by the use of machinery, the Superintendent of State Prisons, Austin Lathrop, having bought three dynamos, which will be distributed between Auburn, Sing Sing and Clinton prisons, each capable of making corpses of healthy men in a period of less than seven seconds. They cost the State \$8000.

Cramp & Sons have received a \$350,000 contract for the construction of a steel steamship for the Metropolitan Steamship Company, of New York. The new craft will be 271½ feet long, 43 feet beam and 19½ feet depth of hold, registering 2625 gross tons.

## MANUFACTURING.

### Iron and Steel.

Soho Furnace, of the Moorehead-McCleane Company, produced 5520 gross tons of pig-iron during the month of April.

The two blast furnaces of Schoenberger, Speer & Co., of Pittsburgh, produced 5354 gross tons of Bessemer pig-iron during the month of April last.

The nailers in the employ of Chess, Cook & Co., Jones & Laughlin, Limited, and Schoenberger & Co., nail manufacturers, of Pittsburgh, have received notice that if the scale of wages for cutting nails recently put in operation at the Bellaire Nail Works, of Bellaire, Ohio, is adopted in the Ohio Valley district the Pittsburgh nailers must also accept the reduction or the machines will be stopped entirely. Out of about 200 nail machines in Pittsburgh only about 75 are being operated, and these only about half time. It is believed that the nailers will agree to accept the reduction, with the expectation that by doing so they will have steadier employment. The scale now in force at Bellaire is a reduction of 35 per cent. on 5d nails and sizes below, and 12½ per cent. on all sizes above 5d. It is the heaviest reduction made for nail-cutting since the long strike of 1882.

The charcoal furnace of the South Mountain Mining and Iron Company, at Pine Grove Furnace, Cumberland County, Pa., was blown out on February 23 in order that improvements in the plant might be made. Since that date the stack has been relined from bottom to top, the hot oven has been renewed and general repairs have been made. The furnace was successfully blown in again on April 20 and 21. It has continued running well, and its capacity is found to have been increased 25 per cent. With these advantages and thorough cleaning of the ore the company expect to reduce the cost of making pig-iron. Mr. S. R. Still is now the superintendent of the furnace.

Some extensive improvements have just been completed at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., by which the capacity of the rail mill has been increased to nine finished rails per minute. The rolls of the blooming mill have been enlarged, and now 1½-ton ingots are made into two blooms, each of which makes three rails. Another saw has been added also, and now three rails can be sawed, instead of two, as before.

The nail factory of the Belmont Nail Company, at Wheeling, W. Va., resumed operations last week, the nailers agreeing to accept the Bellaire scale for cutting.

The blast-furnace of the Bellaire Nail Works, at Bellaire, Ohio, has now been in blast for two years and seven months on its present lining, and during that time has made 123,000 tons of pig-iron, 95 per cent. of which was No. 1 Bessemer. From present appearances the furnace will continue in blast for some months to come.

The 24-inch mill of the National Tube Works Company, at McKeesport, Pa., was put in operation last week to fill a large contract for 8-inch pipe. It has been idle for some time.

The coke blast-furnace of the Paducah Iron Company, at Paducah, Ky., is to be put in blast during the summer. This furnace formerly belonged to the Nova Scotia Iron Company, of St. Louis, and ran on charcoal. It was removed from Salem, Mo., to Paducah in 1888.

On the 7th inst. work was resumed in the pipe mill of the Reading Iron Works at Reading, Pa., to finish 1000 tons of

pipe that had been commenced before the firm suspended. This work will occupy three weeks. The two large blast-furnaces of the works, which have been in operation since the failure, were ordered to go out permanently last week. The assignee will in a few days begin to dispose of the property.

The Bouton Foundry Company, of Chicago, have for some time been engaged in removing their buildings from the old location on Archer avenue to a tract of land which they have secured at Thirty-ninth and Winter streets. In re-erecting the plant a number of improvements have been made, and the owners believe that they will have one of the most conveniently-arranged and perfectly-equipped foundries in the West. They will have an abundance of room for enlarging the plant if that should become necessary. The machine-shop is now partly in operation, and the foundry will probably begin to melt iron this week.

The Pioneer charcoal furnace of the Iron Cliff Company, at Negaunee, Mich., has been doing remarkably good work. The furnace has made thus far on this blast 52,000 tons of pig-iron, and during the last month it averaged over 80 tons daily. The highest product for any one day was 89 tons, which was accomplished on the 30th of April. As the dimensions of this furnace are but 57 feet by 10 feet, it is claimed that this is the best record for a charcoal furnace up to this time. The large output is certainly very creditable to the management, and sustains the reputation which charcoal furnacemen are now making for progressiveness.

The Wellston Furnace Company, of Wellston, Ohio, exhibit in the office of Forsyth, Hyde & Co., at Chicago, a sample of their No. 1 foundry pig-iron cast in the form of a carving knife and ground to quite a sharp edge. The iron is remarkably close grained and shows up well in a test of this character.

The South Halsted Street Iron Works, at Twenty-sixth and Halsted streets, Chicago, are quite busy at present on architectural work. Last week the foundry turned out some of the heaviest columns which have been cast in Chicago. They are 28 inches square, weigh 7½ tons each, and were cast in two lengths, one part weighing 4 tons and the other 3½ tons. These columns are to be used in a very substantial building now being erected for manufacturing purposes in Chicago. The company have contracts for the architectural iron work on quite a number of buildings now in course of erection in Chicago, as well as a large office building and the Masonic Temple in Denver, Col.

Furnace A, of Carnegie Bros. & Co., Limited, at Braddock, Pa., was blown out on the 11th inst., for relining and other repairs. It will be ready for blast again about July 1, next.

A press dispatch from Green Brier, W. Va., under date of the 12th inst., says: "The Glenmore Iron Company, organized with Gen. J. R. Anderson, of the Tredgegar Iron Works, Richmond, as president, will erect a great plant on the Glenmore estate, 3 miles from this place. They have acquired 3000 acres of land, upon which there is a vein of iron ore 40 to 60 feet thick and 6 miles long, which can be mined by open cutting. The Chesapeake and Ohio Railroad will run a branch line to the mines and works."

Wm. B. Scaife & Sons and the Scaife Foundry and Machine Company, Limited, of Pittsburgh, have about completed the greater portion of a new Bessemer plant, with a number of new improvements, for Messrs. Miller, Metcalf & Parkin. The buildings, all of iron frame-work, covered



with corrugated iron, were designed and erected by the first-named firm, and the various styles of cranes, ladles, converters and hydraulic machinery were designed and built by the latter.

#### Machinery.

The Mahoning Boiler Works of W. B. Pollock & Co., at Youngstown, Ohio, are in full operation, with plenty of orders on hand. This is one of the oldest industries in Youngstown, having been established more than 25 years ago.

The Metcalfe Company have recently been organized at Shippensburg, Pa., with a capital stock of \$150,000, for the manufacture and sale of machinery.

J. A. & S. F. Dunkle, of Steelton, Pa., and J. B. Ewing, of Harrisburg, Pa., have recently purchased the entire plant and good-will of the Star Steam Heater Company, of Mount Joy, Pa., including the exclusive control of the patents. Large and commodious shops will at once be built at East End, Harrisburg, according to new plans especially adapted for their business. Three departments—viz., boiler-making, machine shop and foundry—will be fully fitted out with the best machinery. It is expected that the shops will be completed some time during July, when they will immediately be occupied. Meanwhile operations have begun in the old shops in Mount Joy, where work is being pushed to its utmost to supply the demand. The address of the firm is Star Steam Heater Company, Harrisburg, or until after August 1, Mount Joy, Pa. H. H. Lindemuth, the patentee, has connected himself with the new firm and will give the boilers his personal supervision.

The Buffalo (N. Y.) Forge Company have issued a catalogue on heating, drying, ventilating and cooling, which not only shows the fans and blowers made by them, but also shows the machines applied to various uses. The construction and operation of their hot-blast apparatus is also described and illustrated, and its application to the warming of factories of different designs and to lumber dry-kilns is shown. The ventilating arrangements by means of their exhaust disk-wheels are illustrated in the case of school-houses, foundries, machine and blacksmith shops, &c.

A catalogue recently issued by the Buffalo (N. Y.) Steam Pump Company fully illustrates the many and various styles of pumps made by this firm. From the catalogue a clear idea may be formed of the construction and operation of each of the pumps and the work they are designed to perform. The last few pages of the book are devoted to useful information regarding hydraulics, steam-engines, wrought and cast iron pipe, watering-pipes, &c.

The Canton Steam Pump Company, of Canton, Ohio, have recently issued an illustrated catalogue and revised price-list of the Miller duplex steam pump and the Torrent and Unique steam pumps for boiler-feeding, brewing, mining and general purposes. The sectional views accompanying the engravings clearly show the construction and operation of the pumps and their most important features.

#### Hardware.

William Neil & Co., manufacturers of oil tanks for the use of grocers and others, have removed to Nos. 11 and 13 Dearborn street, Chicago, where they will have increased facilities and will be fully prepared to meet promptly the demands of their customers.

Hubbard & Co., of Pittsburgh, have expressed themselves to the effect that they would rebuild their axle factory, destroyed in that city a few weeks ago, in Beaver Falls, Pa., on the same grounds and adjoining their branch works at that

place, provided they could get ground enough. The council has passed a resolution grading a 60-foot street between the branch works and the Western File Works. This will give them ample room, and it is thought will induce them to locate there.

The Youngstown Stamping Company, of Youngstown, Ohio, manufacturers of stamped and japanned ware, report business to be in a very satisfactory condition. One of the articles manufactured by the firm is a glass fruit jar with a patent cover, which is said to be meeting with an excellent sale.

The I. L. Ellwood Mfg. Company, of Dekalb, Ill., have been incorporated with a capital of \$500,000 to manufacture barb wire and other products. The incorporators are Isaac L. Ellwood, Hiram Ellwood and Edward C. Lotta.

The Brainerd Bolt Company, of Chicago, have also been incorporated with a capital of \$500,000. They will manufacture steel and iron bolts. The incorporators are A. M. Brainerd, A. C. Webb, W. R. Jerome and M. J. Enright.

The United States Scale Company, of Terre Haute, Ind., report trade better than usual during the spring months. Despite the natural gas there is great activity in the coal-mining business, and the demand for railroad scales in this line of business is greater than ever before. They report recent shipments of five 50-ton scales to one firm in Ohio; one 50-ton, 54 feet long, to Kanawha and Lake Erie Coal Company, of West Virginia; one of the same kind to the Leavenworth Coal Company, Leavenworth, Kan.; also same to Glendale Coal Company, St. Louis, Mo.; also same to S. W. Little, Evansville, Ind.; and one 40-ton, 36 feet, to Charles Valier, Greenville, Ill.

#### Miscellaneous.

There were shipped from the ports of Marquette, Escabana and Ashland during the week ending May 1 133,763 gross tons of iron ore, of which quantity 16,741 tons went from Marquette, 86,347 tons from Escabana, and 30,955 from Ashland. Shipments have begun from the Vermilion, Minn., mines also, but the report from Two Harbors has not yet reached us. With the Two Harbors shipments added, the shipments for the week would no doubt be 150,000 tons, which is well up to the average weekly shipments of previous years after the season had fairly opened. At this season in 1888 no ore had yet gone forward, so it will be seen that the mines are getting a good start over last season in the matter of getting their product to market.—*Mining Journal*.

The works of the Novelty Steel Wheel Company, recently organized in Pittsburgh, will be located at Bissell, on the Baltimore and Ohio Railroad. The main building will be a two-story iron structure 40 x 208, and the machinery, which will be of a special design, will be made in Philadelphia. The works will be in operation in about three months and will furnish employment to about 75 men at the start.

The Wrought Iron Bridge Company, of Canton, Ohio, have just secured the largest single contract they have ever taken. It is for the structural iron-work of a massive all-steel viaduct for the Denver Cable Railway Company, of Denver, Col., which will require for its building over 1000 tons of steel structural work and over 1,000,000 feet of lumber. To transfer the steel-work it will require 75 cars, and this will be the largest shipment ever sent out of Canton. The price is \$135,000.

The annual meeting of the stockholders of the Philadelphia (Westinghouse) National Gas Company was held in the office of the

company at Pittsburgh last week. George Westinghouse, Jr., president, was in the chair. According to the statement read by Mr. John Caldwell, treasurer, the total assets of the company amount to \$10,805,888, an increase of \$1,100,000 over last year's assets. The gross earnings during the year were \$2,756,217 and the expenses \$1,696,293, leaving net earnings, \$1,059,923. The dividends paid during the year amounted to \$900,000. The company operate 181 producing wells and have 706 miles of pipe laid. From Mr. Paine's report it was learned that the company propose to pay the dividend quarterly instead of monthly, which was accepted. The new steel line which the company are laying from Thirty-third street to Leamington avenue and Tilford station is estimated to cost \$300,000. Seventy-seven miles of new telephone lines have been laid by the company during the year. The company have only sold \$375,000 of \$2,500,000 bonds issued, and it was stated by Mr. Westinghouse that the directors had been hampered in selling any more because the Charters Company were selling theirs cheaper than the Philadelphia Company would let them go. Ninety-four thousand votes were cast on the election of the board of directors, and the old board was re-elected. Their names are: A. M. Byers, A. Groetzing, Robert Pitcairn, Charles Paine, John Caldwell, C. H. Jackson, J. A. Chambers, Calvin Wells and George Westinghouse, Jr. Subsequently the board organized, and the following-named officers were elected: George Westinghouse, Jr., president; Charles Paine, vice-president and general manager; J. R. McGinley, secretary and general agent; John Caldwell, treasurer; T. A. Gillespie, general superintendent.

The Hall Mowing Machine Company have been incorporated at Portland, Me., to manufacture lawn and field mowers under the patents granted George A. Hall. President, Hon. Charles J. Chapman; clerk, Seth L. Larrabee; treasurer, Clinton A. Woodbury; superintendent, George A. Hall. Directors: Hon. Charles J. Chapman, Geo. A. Hall, William H. Stevens, C. A. Woodbury, T. B. Percy.

Among recently authorized corporations in the State of Illinois are the following: The Lewis Metallic Packing Company; capital, \$30,000; for the manufacture of piston-rod packing; incorporators, G. C. Fry, A. D. Lewis and J. E. Babb. The Anti-Railroad-Frog Company; capital, \$8000; for the manufacture of substitutes for railroad frogs and other railroad appliances; incorporators, A. A. Ackerly, L. Bartlett and W. P. Graves. The Chicago Matrix Machine Company; capital, \$1,000,000; for the manufacture of matrix-making machines; incorporators, E. B. Springer, G. M. Brinkerhoff and P. H. Gunkel.

**Rates on Cotton Ties.**—The freight agents of the railroads having connection with Pittsburgh have reduced the rates on cotton ties from that city to East St. Louis to 14½ cents in carload lots and to 18 cents in less than carload lots. The rate to Cairo, Ill., has been reduced to 17 cents in carload lots and 21 cents in less than carload lots. From the Mahoning and Shenango valleys the rate on the same article to East St. Louis has been reduced to 12½ cents in carload lots and to 16 cents in less than carload lots. To Cairo the rate has been reduced to 15 cents in carload lots and 19 cents in less than carload lots. The new rate from Pittsburgh went into effect on the 13th inst., and the new rate from the valleys on the 10th inst.

The Grand Jury at Bridgeton, N. J., has indicted Master Workman Coffey, of the K. of L., for inciting men to strike recently in a factory in that place.

# The Iron Age

New York, Thursday, May 16, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

The Chicago editorial and business offices of *The Iron Age* have been removed from 95 and 97 Washington street to 59 Dearborn street.

## Eastern and Western Pig-Iron Prices.

The Western newspapers have treated the announcement of the Thomas Iron Company's reduction in the price of pig-iron as a sensation worthy of glaring head-lines. To them this change in prices comes like a revelation, and they are bound to make the most of it for the benefit of their readers. The effect of the sensational statement that pig-iron has been reduced \$1.50 per ton by the leading manufacturers of the East has been quite marked in the West. The circumstances under which this reduction of price was made were fully set forth in our last issue, and it was clearly shown that the company had been for some time sustaining the market for native iron considerably above the rates at which other iron could be bought. This does not seem to have been fully understood in the West, but consumers believed that the whole range of Eastern prices had been suddenly dropped \$1.50 per ton. They therefore, in a number of instances, have argued with Western sellers of iron that prices would have to come down in that section to correspond with the new range of values established in the East. If it were true that Western prices had been maintained at about the same rates as the Thomas Iron Company's former figures, the reduction would probably take place in time out of sympathy with the condition of other markets. But this is not the case. The reduction just announced in the East was made long since in the West.

It is a remarkable fact, which Western consumers of pig-iron do not seem to realize, that for some time pig-iron has been quoted at lower rates at Chicago than at any other Northern consuming center of any prominence. Our market reports have shown this from week to week. Cincinnati, Louisville and St. Louis are cheaper pig-iron markets, but as they are just on the border and handle a great preponderance of Southern iron, they are excluded from this comparison. The market reports in our last issue quote No. 1 Northern foundry iron at \$16 at Chicago, against \$17 to \$18.50 at Philadelphia, \$17 to \$17.50 at New York and \$16.25 to \$16.75 at Pittsburgh. Southern foundry iron is available at \$16 at both Chicago and New York. It will be seen that at Chicago either native or Southern iron can be had at the same price, which is not the case in Eastern markets. This puts the Chicago consumer in a much more favored condition than his fellows enjoy in the East. And this advantage he has had for months, as will be seen by reference to our market reports. It would therefore seem to be

wholly unreasonable for a Western consumer to expect that because Eastern prices have been reduced to nearly the Western level a further decline should be made in Western prices.

The change in the Western iron trade which has taken place within the past year or two has been so radical that it is not yet fairly understood and does not receive proper consideration, even among those who should be thoroughly informed. The time has been when Chicago prices were based on rates established at points further East, the difference depending mainly on freight schedules. At such a time the action of an important Eastern furnace company in raising or lowering prices would have had a decided effect on prices at Chicago. But those days have passed, probably forever. The consumption of pig-iron in that section might increase so rapidly that the local furnaces could not supply it, and in that event prices would be somewhat dependent on quotations made by distant makers; but such a contingency is certainly remote. Meanwhile Western prices for pig-iron will be regulated by the natural laws of supply and demand within the territory tributary to the furnaces and without much regard to occurrences in distant markets, until they assume a much more general character than this recent action of the Thomas Iron Company, which has been so widely published. Western prices may recede slightly from their present range, but it is altogether unlikely that they will fall \$1.50 per ton more during this particular period of depression.

## The Competition of Canadian Railroads.

The Interstate Commerce Committee of the United States Senate, during their sessions in this city last week, do not seem to have found much of a case against the Canadian railways. The argument in favor of protection to American railroads, as well as to American manufacturers, is of course sound, but the analogy seems to end with the theory. No testimony has been offered to prove that, as a matter of fact, Canadian roads were offering unjustly low rates. At first the committee seemed to misapprehend the differential rates question, thinking them to be favors to the Grand Trunk, but it was explained that lines like the Chesapeake and Ohio and the Chicago and Atlantic, in our own borders, had them. Albert Fink's testimony that they were fair seemed to dispose of the question. The subsidy granted the Canadian Pacific was given, but no evidence was offered to show that the American lines were injured by it.

The testimony of the merchants before the committee was entirely in favor of allowing the carriage of goods through Canada to continue. It was shown that American interests were deeply involved in the question, and it is probable that a policy of exclusion would cause more loss to our own citizens than to Canadians. Nearly every Eastern railroad except the Pennsylvania and the New York Central would be hurt. The Central Vermont would be greatly injured. The commercial interests dependent upon direct transportation through Canada are very large; sudden stoppage would mean hardship to many of them, and this alone is reason

enough for its continuance. Our down-East friends at Portland, Me., and throughout New England would be deprived of one and in some cases the only outlet to and from the West. Detroit and all of Michigan would be put in a sort of business *cul-de-sac* for their trade Eastward. Chicago has for some time been favorable to the Grand Trunk, the merchants thinking that that company have kept rates down. St. Paul, Minneapolis and the Northwest would lose a valuable route for flour and merchandise. The moment the possible results of a stoppage of the bonding privilege, and consequently of carriage of goods through Canada, are seriously contemplated it becomes apparent that without strong and convincing reasons the business men of the United States will not consent to bear the losses which such a stoppage would necessarily entail upon them.

The discussion of the witnesses took a range wider than the subject in hand, embracing all the results of the Act to Regulate Commerce. There was a surprising unanimity of sentiment in favor of the law. Not one railroad manager or business man advocated the repeal of the act, though amendments were suggested, and even of these many were such as to be now practically in the power of the commission to effect without changing the law itself. Pooling was thought necessary by the railroad managers, but was asked for only under careful restrictions. Merchants thought that business men had not been enough consulted by the classification and rate committees of the railroads, and undoubtedly the complaint was just. The president of the Union Pacific seemed to utter the general opinion when he said that the law ought not yet to be modified, and meanwhile that it should be rigorously enforced. The prevailing sentiment seemed to be that as yet the alarm raised against transportation through Canada had but little foundation.

A brief cable dispatch, remarkable chiefly for the number of errors which the sender managed to crowd into about 80 words, announces that the Iron and Steel Institute of Great Britain will hold a meeting in the fall of 1890 on this side of the Atlantic. We may state that the invitation emanated from the Council of the American Institute of Mining Engineers, who, we understand, have informed the governing bodies of the American Society of Civil Engineers and the American Society of Mechanical Engineers, coupling their preliminary announcement that an invitation had been sent with the suggestion that the societies in question co-operate with the mining engineers. We understand that Andrew Carnegie has been named as the chairman of the American committee, which will embrace the leading manufacturers of iron and steel in the United States, and will include the most prominent engineers. No efforts will be spared to make the visit of the English iron-masters memorable to them professionally and socially, and they will be certainly afforded every opportunity to study our resources and our methods of manufacture. It is probable that a joint meeting of the English and American societies will be held at some central point, possibly Pittsburgh, and it may be arranged that such Continental organizations as the Verein

Deutscher Eisen-Hüttenleute, a worthy rival of the Iron and Steel Institute, will participate.

#### The Trade of Chicago in 1888.

The magnitude of the business interests of Chicago is most comprehensively shown in the report just issued by George F. Stone, secretary of the Board of Trade. He has gathered from all sources facts and figures bearing upon every branch of prominence represented in the trade of Chicago, and has incorporated with them a large accumulation of statistical information relative to national matters of interest to business men. The tables cover population, public debt statements, valuation of property, prices of farm products, exports and imports, crops produced for a series of years, &c. The report has been prepared with great care and forms a valuable addition to our statistical literature.

Referring to the trade of Chicago, the very important fact is pointed out by Mr. Stone that by far the largest class of manufacturing industries, except what is known as meat production, is that relating to iron and steel. The rolling mills in and near Chicago turned out in 1888 a product valued at over \$16,000,000 and employed nearly 700 hands; the foundries, machine shops, boiler works, car-wheel works, stove works, &c., turned out a product valued at \$28,000,000 and employed over 10,000 hands. The quantity of pig-iron handled was necessarily very large, aggregating 850,000 tons, valued at \$17,000,000. The wholesale trade in manufactured iron and hardware, in which some of the largest jobbing houses in the country are interested, amounted to \$11,500,000.

As Chicago is particularly conspicuous for meat production, the statistics of this branch of business are worthy of consideration. Meat production includes hog-packing, beef packing and canning, and the manufacture of refined oil, stearine, butterine and sausage. The total value of this production in 1888 was \$95,000,000, and 20,000 hands were employed. A comparison of these figures with those of the preceding paragraph shows that the iron and steel business of Chicago is fast overtaking the line which has hitherto been most prominent in the trade of the city. Those who are most familiar with the developments of the past few years in the Chicago iron trade will not be surprised if a further rapid advance is made in the near future which will thoroughly establish the ascendancy of iron and steel over all other interests represented in that city.

The statistics of other trade movements at Chicago reach enormous figures. For instance, the receipts of flour and grain in 1888 aggregated 182,588,188 bushels; the number of hogs received was 4,938,413, together with 2,611,543 cattle and 1,515,014 sheep; the lumber received amounted to 2,066,927,000 feet; the tonnage of vessels arrived during the year was 4,898,768 tons; the total number of miles of railway tributary to Chicago is 70,431, of which 41,870 miles lie west of the Missouri River; the total bank clearings for 1888 were \$3,163,774,462; the number of manufacturing factories is now 2400, employing a capital of \$117,000,000, giving work to 132,000

hands, to whom yearly wages of \$74,000,000 are paid, and turning out a product valued at \$402,000,000; the wholesale trade in all lines amounted to \$455,000,000 in 1888, against \$370,000,000 in 1884; the agricultural-implement industry of Chicago, although mainly confined to three large establishments, gives employment to about 4000 men, who turn out about \$12,000,000 worth of goods annually; the receipts of coal in 1888 were 5,517,859 tons.

Although Chicago is an inland city, its trade connections have been well established over the civilized world. The direct importations of all classes of goods in 1888 amounted to \$13,805,354. Among them were 397,641 boxes of tin-plate, 16 cases of needles, 2416 cases of manufactured metals, 1102 tons of pig-iron, 168 packages of hardware, 368 cases of fire-arms, 151 cases of cutlery and 25 cases of bicycles. Large quantities of manufactured goods are exported, as well as grain, flour and provisions, but it is impossible to obtain the statistics of such shipments, as they are credited in the Government reports to the cities where they are transferred on shipboard. The project of a navigable water-way from Lake Michigan to the Mississippi River, which has been constantly growing in favor and seems reasonably certain of being undertaken at an early day, derives much of its support from the desire felt by Chicago business men to secure as many channels of intercourse as possible between their city and remote sections. Such an outlet to the South will be found specially valuable in case the steamship lines now contemplated are established between Gulf ports and cities in Central and South America.

#### The Improvement in Mexican Affairs.

The improvement that has been going on during the past four years in nearly every department of national life in Mexico is very striking, and recent advances were dwelt upon in detail in President Diaz' message to Congress of April 1. Our industrial and commercial interests with Mexico have become so interwoven that the improvement in its finances through good administration of public affairs is a matter of much concern to the American manufacturers, merchants and railroad men. It is a subject for congratulation, too, that President Diaz has entered upon another term of four years, and that all the capable men who assisted him, together with Minister Romero at Washington, remain in office. When on December 1, 1884, President Diaz took the helm of State for the second time Mexican finances were in a terribly confused state, and there was little hope that the subsidies to railroad companies would be paid regularly for a long time to come. The recognized domestic and foreign federal debt of Mexico, after throwing out the Maximilian bonds and others like, for example, the famous Jecker bonds, amounted at the time to \$144,058,785. The foreign debt, then aggregating \$108,812,570, by honest arrangements and payments has since been reduced by no less than \$87,000,000, and a large amount of floating debt been paid off. When President Diaz formed his present Cabinet in 1884 Mexican bonds were far below par in the London market. After a long negotiation

Dr. Dublan, the Minister of Finance, completed an arrangement with Bleichroeder, of Berlin, by which a Mexican loan of £10,500,000 was to be placed upon the foreign market at par, the payment to be in Mexican foreign bonds at 50 per cent. of their face value. This, of course, meant practically to reap the advantage of an understanding previously arrived at with the British bondholders to cancel their 3 per cent. bonds within a given time at 40 per cent. Bleichroeder took £7,600,000 at 84, with the proviso that he could call for the remainder of the bonds if they proved popular, and on May 1 last the Government made the official announcement that the Berlin banker had made a demand for the remainder, for which he held an option. In President Diaz' message we find the following passage: "The interest on the home and foreign debts has been met with strict punctuality on the day of maturity. The bonds of the Berlin loan are now quoted in Europe at 93½; the reserves are increasing, the collections in the first half of the current fiscal year being greater than in the corresponding period of the previous year."

Other portions of the message related to public works. Mexico, according to this document, has at present about 5000 miles of railroad in operation (against 3438 on December 1, 1884), and a number of new lines are now under construction and in part built. Mexico has nearly 14,000 miles of telegraph lines. The culture of the vine and of silk is rapidly increasing; the army has been reduced. He remarks:

The mining industry continues in full development, and the good effects of the law of June 6, 1887, in regard to the concessions of mining zones, are visible in the number of contracts that have been made in accordance with its prescriptions. Their number is 155, of which nine have been declared forfeited, and four zones covered by as many of the forfeited contracts have been newly solicited. The contracts now in force promise an investment in mining enterprises of more than \$40,000,000, and the amount deposited in public-debt securities, bonds of the mortgage bank, and in cash, as a guarantee of the fulfillment of those contracts, is \$280,000. In order to facilitate information in regard to the country, &c., Mexico participates in the Paris Exposition, and pains have been taken to send thither a complete collection of such objects and products as will convey an adequate idea of its resources and industries. The day is not far off when our national establishment of pisciculture will begin to show useful results; a similar establishment in the United States has favored us with important gratuitous assistance. From September up to the present more than 5,000,000 hectares of public land have been surveyed by companies duly authorized, thus adding to the area available for colonization or sale. Indeed, through the land sales in the border States large areas have been opened which were formerly unproductive, enhancing the value of private property and increasing the revenues of the States named. The Vera Cruz harbor improvement works have continued without interruption, 1170 blocks of 14 c. m. having been submerged. These blocks will gradually form the foundation for the great breakwater that is to protect the port on the northwest. The hydraulic works undertaken to protect the bank of the Rio Bravo at Ciudad Juarez (El Paso) are on the eve of completion, seven jetties having been constructed in that locality and three at Matamoras; these, in connection with those existing at the latter point, will protect the city from serious dangers that threaten it. The Department of Public Works and its subordinate offices have prepared a general map of the country, as well as nine special charts of the railways, telegraph lines, geology, mining, &c., and four agronomical charts exhibiting

our chief agricultural products. All of these, together with the topographical charts prepared by the geographical exploring commission, and those prepared in other sections of the Department, with a number of documents of various sources, are to go to the Paris Exposition. The ten mints of Mexico coined in 1888 in the aggregate \$6,276,364 silver. The common school system is meeting with popular favor, and regulations for primary compulsory education will now be completed, while for the training of male teachers a normal school has been established, and the furniture and apparatus for a normal school for female teachers are now being put in place.

This item of education is of all the greater importance in view of the fact that of the 12,000,000 inhabitants only 19 per cent. are whites, 88 per cent. pure Mexicans and 48 per cent. mixed races. The number of wild Indians (chiefly in Yucatan) does not exceed 15,000; the rest are civilized, till the soil and are employed in manufacture, &c., but millions of them still speak the native Mexican tongue. To thoroughly educate these masses is therefore conferring a boon which cannot be estimated too highly. In fact, as our extracts from the message show, there is not a branch that is neglected in the Republic.

#### Cable Yoke Contracts.

The introduction of cable propulsion for street-cars has opened up a new field for foundries, particularly in the West, where the system has met with marked favor. The cast-iron yokes which are used to support the rails and the cable conduit furnish a great deal of work to foundrymen, as but a few miles of cable road will require yokes whose tonnage runs into the thousands. The competition for this class of business has been very animated among the foundrymen of the West, as the corporations building the roads are usually well equipped with funds and are very desirable customers. The work appears to be specially inviting, all the yokes being practically of the same dimensions and weight. This competition has forced prices to an unnaturally low point, and it is not singular that foundrymen are considerably exercised at this condition of affairs. A peculiar feature of these yoke contracts is that those who have had experience in manufacturing them, and therefore should be presumed to know how closely they could safely make their bids, are always beaten by inexperienced firms. A leading construction company who have built quite a number of cable roads in the Northwest state that every time they let a contract for yokes it is to a new foundry, whose estimates of cost undergo a radical reconstruction after the work of manufacturing them has actually been begun. Experienced Chicago foundrymen agree in placing the cost of manufacturing yokes at \$27 per ton with pig-iron at \$14 per ton, and their bids on this class of work range from \$28 to \$30 per ton, according to the profit which each thinks he should have. Yet other foundrymen, who pay the same price for pig-iron and the same wages to their molders, turn in their bids whenever a new contract is to be given out at several dollars a ton below the actual cost stated above, and take the risk of imperfect castings and the large percentage of rejections which is inevitable under the rigid system of inspection adopted by the builders of the roads. It is not surpris-

ing that they lose heavily on these contracts and join the high bidders the next time. But a new candidate for the honor of making yokes at a low price then steps in, and with a serene confidence in his ability to keep down costs takes the work. It had been supposed that several occurrences of this kind would impart a general knowledge on the art of making yokes profitably to the foundry trade, but this does not seem to be the case, and a branch of business which should be of great importance to foundrymen bids fair to continue profitless until many more manufacturers have acquired experience.

#### The Charcoal Furnaces on May 1.

There has been a slight increase in the capacity of the charcoal plants operating throughout the country, due chiefly to the blowing in of a few of the larger plants.

Charcoal Furnaces May 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	7	600	7	530
New York.....	10	3	423	7	530
Pennsylvania.....	23	3	260	20	849
Maryland.....	8	3	261	5	285
Virginia.....	23	1	43	22	904
West Virginia.....	3	0	0	3	165
Ohio.....	13	6	328	7	347
Kentucky.....	3	1	120	2	100
North Carolina.....	3	1	70	2	70
Tennessee.....	3	3	901	0	730
Georgia.....	2	0	0	2	114
Alabama.....	9	9	1,798	0	0
Michigan.....	25	11	3,859	14	3,162
Minnesota.....	1	0	0	1	190
Missouri.....	3	1	281	2	528
Wisconsin.....	7	3	1,411	4	491
Texas.....	1	0	0	1	173
California.....	1	0	0	1	120
Washington.....	1	1	175	0	0
Oregon.....	1	1	181	0	0
Total May 1.....	157	54	10,629	103	9,278
Total April 1.....	167	53	10,173	114	10,956
Total March 1.....	167	55	11,081	112	10,981
Total Feb. 1.....	167	62	11,219	105	10,406
Total Jan. 1.....	169	67	11,946	102	9,822
Total Dec. 1.....	169	71	12,286	98	9,397
Total Nov. 1.....	169	73	12,724	96	8,941
Total Oct. 1.....	175	71	11,619	104	9,088
Total Sept. 1.....	178	67	11,243	109	10,004

In Pennsylvania Mont Alto suffered from a disastrous fire and Eagle went out for repairs in April. Pine Grove, remodeled, started successfully on the 22d under the superintendence of S. R. Still. The furnace has been relined, its height, diameter of bosh, crucible, the height of its cinder-notch and of its tuyeres was changed, and practically a new hot-blast oven was built. In Maryland both the Stickney furnaces are at work, No. 1 Maryland was started in April, and Muirkirk is to blow in this month. In Kentucky Hunnewell is again running. In Ohio Mount Vernon blew in during April. In Michigan the total product of the furnaces, all of them reporting, was 15,644 tons. Gaylord blew out for the purpose of making general repairs, which will probably consume three months. Pine Lake blew in late in April. The Pioneer has made an exceptionally good run during April, the average daily product for the whole month being 77 6 tons. In Wisconsin Hinkle was stopped nine days and did not therefore make its usual heavy monthly product. In Missouri Sligo blew out on April 14, but is expected to resume at an early date. La Grange, in Tennessee, started in April, and the old Standard, now controlled by the Warners, has probably been making iron for some days. In Alabama No. 1 Shelby has gone out, to be rebuilt entirely.

Secretary Tracy has extended for four months and four days the time allowed the Union Iron Works, of San Francisco, in

which to complete cruiser No. 5 (the San Francisco). This is one of the large 4000-ton cruisers which was contracted for October 27, 1887, at a cost of \$1,428,000.

## CORRESPONDENCE.

#### No Case of Yellow Fever at Sanford.

To the Editor: I notice in your current issue a statement that Sanford has a case of yellow fever, resulting in death, &c. Will you allow me to say that, despite the State Board of Health, we have not had a case of yellow fever in this city either this or last year? The diagnosis of the reputed case was made by an alarmist who is desirous of making for himself a reputation as a fever expert, even if he has to make such reputation at the expense of his friends and fellow-citizens. There is not to-day, nor has there been since the death of Mrs. Demont, a sick person, male or female, in the city or suburbs. The suspect camp, originated by these expert (?) doctors, has been broken up and all restrictions to travel, &c., removed. As soon as Dr. J. Y. Porter, the State health officer and an experienced yellow fever expert, came on the ground and investigated the foolish, senseless scare and quarantine caused thereby he immediately modified it and removed a great many restrictions.

It is our misfortune that we are harassed and afflicted with an army of self-constituted crank doctors, from whom as yet there is no immunity, but we would be a grateful people if the press of the country would take no heed, and thus protect us in this way. Kindly give a part of this letter the same prominence as you did the notice of the "Case of Fever at Sanford," and oblige, yours truly,

WILLIAM T. COTTER.

Sanford, Fla., May 7.

The gun-boat Petrel, built by the Columbia Iron Works, Baltimore, was given a trial trip to test her engines. While she did not come up to the requirements of the Government as to horse-power, she showed herself fully capable of doing it when the machinery was in perfect working order. Between Seven-Foot Knoll and North Point she averaged nearly 15 knots with her engines working 110 revolutions a minute, and on the last quarter nearly 17 knots. It took 1½ minutes to stop her when going at full speed and 28 seconds from full speed to reverse her. The best test was made when she ran 17 knots with 115 revolutions. William H. Varney, superintendent of hulls for the Government, said that he was very much pleased with the trip and was sure the new boat could make an average run of 15 knots with the 1850 horse-power required by the Government. The Government trial trip, which must be taken before the Petrel is turned over to take her place in the reconstructed navy, will be made in about three weeks.

An unofficial trip of the uncompleted cruiser Charleston was made between San Francisco and Santa Barbara with satisfactory results. A maximum speed of a little more than 14 knots an hour was made, and a steady speed of 11 knots was maintained in a rough sea.

A convention of the American Society of Civil Engineers will be held at the Octagon House, Seabright, N. J., on June 26. About 250 delegates and visitors will be present, and the convention will be in session for one week.

The Royal Society, at Ottawa, have appointed a committee to welcome the American Institute of Mining Engineers on their visit to Canada next fall.



## THE MECHANICAL ENGINEERS.

### The Erie Meeting of the American Society of Mechanical Engineers.

The nineteenth meeting of the American Society of Mechanical Engineers is now in session. Among the members in attendance or expected are the following: Horace See, H. R. Towne, F. H. Ball, F. F. Hemenway, John W. Weston, J. L. Horn- ing, A. L. Ide, W. M. Welken, C. H. Parker, C. H. Manning, F. R. Low, C. W. Bray, William Roberts, F. M. Hartreck, W. S. Doran, E. H. Parks, C. D. McDuffie, G. H. Smith, R. J. Gilmore, Prof. F. R. Hutton, S. A. Smith, A. L. Burns, W. W. Sprague, F. A. Shaffer, E. W. M. Hughes, J. S. Miller, H. R. Barnhurst, J. A. Gil- kerson, W. C. Jones, L. C. Skinner, J. H. Raymond, J. K. Hallock, E. Fawcett, W. H. Wiley, D. Ashworth, W. A. Ball, E. F. Davies, C. M. S. Smith, J. H. Cooper, H. H. Supplee, W. J. Creelman, Prof. De Volson Wood, J. W. Cloud, C. W. Nason, Alfred Betts, C. M. Morse, H. W. Spangler, W. L. Clark, Prof. J. E. Den- ton, Prof. J. D. Webb, T. J. Ridgway, George W. Passel, E. L. Moore, William Hardwick, R. W. Ryan, William Ruth, J. G. Sowter, S. Higgins, S. J. McFarren, Harris Tabor, Geo. Higgins, W. F. Mattes, Charles Bauer, F. G. Coggin, E. J. Fickengier, J. H. Springer, Henry Buckley, E. A. Mehling, Lycurgus B. Moore, A. F. Nagle, H. I. Snell, L. S. Randolph, J. J. Illingworth, James B. Ladd, Francis C. Blake, W. W. Drum- mond, A. P. Trautwein, John Skenson, J. C. Debes, A. C. Christensen, Peter Kirkerag, R. H. Soule, R. W. Bailey, Thomas D. West, J. A. Roche, Charles J. Hillard, F. W. Taylor, A. E. Manchester, Edwin Reynolds, F. D. Potter, W. G. Stewart, L. G. Laureau, Alfred R. Wolff, F. H. Pend, John Dick, R. C. Carpenter, John Walker, William Forsythe, Geo. A. Porter, James N. Warrington, C. J. Woodbury, D. W. Payne, A. M. Goodale, Prof. R. H. Thurston, John L. Gill, J. L. Bancroft, Coleman Sellers, Jr., B. H. Warren, August Sinclair, Samuel Hig- gins.

On Tuesday afternoon the members vis- ited the water-works on the shore of Lake Erie, and examined the 5,000,000-gallon Gaskill compound duplex pumping engine, and also the pair of old Cornish pumps of same capacity. The two engines fur- nished an interesting study of the past and present methods of raising water. From the top of stand-pipe, which is 250 feet high and the third highest in the world, a very few of the visitors obtained a grand view of city and lake. At

#### The Evening Session

Mayor Clarke heartily welcomed the engineers, and hoped that their visit to the city, whose prosperity was largely due to the efforts of resident members of the society, would be remembered with pleasure. President Towne thanked the Mayor for his kind words of greeting. After the address a most tempting repast was served.

The address of ex-President Horace See, which should have been delivered at the meeting in last October, but was postponed because of his severe illness at that time, might have been termed "Practical Edu- cation." As the supply of skilled work- men is insufficient to meet the demand which the marvelous growth and diversif- ied character of our manufacturing inter- ests has created, numerous schemes have been advanced for the education of the young to fill any position, from the work- man to the manager. It has been suggested that the mechanic arts high school be brought into our existing system of public education, the course of study to be three

or four years, two-fifths of the time daily being given to selected or graded shop- work, one-fifth to drawing and two-fifths to appropriate book-work. This plan is not favored, as the boy, after having ob- tained his load of science, technology, in- dustrial art and commercial activity, can- not be brought to work at the trade, as he aspires at once to something higher. One of the most prominent schemes, on account of the large endowment of the institution, and one which shows how far from nat- ural methods the teaching of the young to become skilled workmen is drifting, is that of a free school to be located in an agricultural country at a distance from manufacturing establishments. It is im- portant that the machinist acquire his skill by contact with the best mechanics, by practice in and by familiarity with the customs, usages, character and variety of work of the workshop.

"It would be a great advantage to our youths if the common school education were modified so as to call on all of the faculties of the mind, and not to rely so much on cramming the memory. The eye should be taught early to perceive, and the hand to delineate, the objects around. The knowledge acquired in this way would be real, and of more value to the possessor than all that is abstract in most of the pur- suits of life. Let us bend our efforts and lend our assistance to hasten the time 'when,' says Sweet, 'more of the mechan- ical branches of our educational institutes shall find their true position, and where the students shall be instructed by example of noble work, rather than by the toy models abounding in confusing compli- cation which they cannot understand, and which are constructed regardless of pro- portion and meaningless in design, and are pernicious in every sense of the term. Let us hope, if the tide of human progress is sweeping on toward a more useful edu- cation, that the day may not be far away when he who knows what to do and how to do it will be regarded as the equal of him who only knows what has been done and who did it.'"

#### Wednesday Morning.

On Wednesday morning the report of the council showed a total membership of 986.

The following deaths were reported: Daniel N. Jones, C. H. Delamater, John Ericsson, H. F. Gaskill. The council prepared a minute stating that in the death of Captain Ericsson the profession of me- chanical engineering had lost one of its most illustrious representatives, whose life spanned the entire epoch of the locomot- ive. The resolutions briefly cited the great works done by the immortal Swede, and closed with the following:

That a committee of the American Society of Mechanical Engineers be appointed by this council to memorialize the Government of the United States to commemorate in some suitable manner the prominent services ren- dered to this country at a time of great na- tional crisis by the engineering genius and skill of our late member, Capt. John Ericsson.

The first paper presented at the Wednes- day morning session was by Thomas S. Crane, on "The Piping of Steel Ingots." This we publish in full elsewhere in this issue. There was no discussion.

The next paper was by Henry R. Towne, on "Gain-Sharing," a term coined to dis- tinguish the system proposed from "profit- sharing." The factor affecting the profit fund of a manufacturer who buys raw material, makes it up and sells the prod- ucts, may be divided as follows:

1. Those contributed by the owner, such as capital, buildings, plant.
2. Those influenced by the mercantile staff—the buyer and selling agent.
3. Those determined by causes beyond the control of the principal and his agents, such as fluctuations in cost of raw material

or in the market value of the finished product, losses by bad debts, &c.

4. Those influenced by the workmen, such as care of property, economy in the use of material and supplies, and, chiefly, efficiency in the use of machinery and em- ployment of labor.

"Now, it is obvious that while the opera- tives may influence the items in the fourth or last group to an extent which may be large, or even controlling, in determining the question of profit or loss, they have little control—and in most cases none whatever—over the items specified in the other three groups; and that to admit them to participation in the net results of the whole business, while commendable as an act of generosity, is not defensible either on an equitable adjustment of the complex and often conflicting interests involved, nor as a theoretically correct solution of an economic problem. The right solution of this problem will mani- festly consist in allotting to each member of the organization an interest in that portion of the profit fund which is or may be affected by his individual efforts or skill, and in protecting this interest against diminution resulting from the errors of others, or from extraneous causes not under his control. Such a solution, while not simple, is attainable under many circumstances, and attainable by methods which experience has shown to be both practical and successful." Having ascertained the cost of the product in labor, supplies, &c., the principal offers the employee one-half of any gain or reduction of cost which he may effect, the wages to be those gener- ally paid for similar services. If the total gain was \$800 and the aggregate wages paid during the year \$10,000, then one- half of the gain, or \$400, would be paid to the operatives, each of whom would be entitled to a dividend of 4 per cent. on his earnings during the year. This is the "gain-sharing" system. As the foreman has more power and control than any sub- ordinate, it is proper that his interest should be larger, and the author of the paper prefers to allot him a definite part of the profit fund—from 10 to 15 per cent. Mr. Towne also considers this method as applied to the contract system of work. It has been found very beneficial to have posted in each department where the gain- sharing system is in force a suitable blank on which can be entered each month the net results of the working for the preced- ing month, and including a statement of the rate of dividend earned since the be- ginning of the contract year. The stimu- lus thus given to the interest of the em- ployees is very marked. Another impor- tant point is the question of the length of time during which a contract for gain- sharing shall continue without modifica- tion. When the cost of the product is accurately known a contract may be safely made for a long time, from three to five years, but when the cost is not well known it is better to fix the terms for a shorter period.

"In the case of a foundry, the gain- sharing system can be easily and advan- tageously applied. Here economy of material as well as efficiency of labor is largely under control of the operatives, and should be made a factor in the account. This can be accomplished by basing the 'cost of product' upon the ascertained results of a previous period, labor and miscellaneous items of small supplies being charged up at actual cost, and fuel and metal being charged accord- ing to an arbitrary scale of fixed prices, which may conveniently be determined by adopting the average market rate during the previous year or at its close. The arbitrary values for material which are thus adopted are then incorporated in the gain-sharing contract, and remain un- changed during its period. The 'contract

prices' for finished product are deduced from the actual results of the preliminary period, the cost of material being calculated by extending the actual quantities at the arbitrary prices per pound or other unit which may have been adopted for the proposed contract, the employer using his discretion as to how close the contract prices should be to previous actual costs. Where the foundry product is of varied character, a separate price is fixed for each class of castings, and a record kept of the output of each."

Appended to the paper were the results obtained in a number of cases to which the gain-sharing system had been applied by the Yale & Towne Mfg. Company, of Stamford, Conn., and also the rules governing the system as applied to the foundry. The dividends ranged from 0.03 per cent., the smallest, to 0.123 per cent., the highest.

Professor Denton stated that gain-sharing would tend to make that workman more contented who has a direct interest in the business. The system is tried on a small scale at the Stevens Institute, where the testing work coming in is distributed among the instructing mechanics, who are given an interest in the profits. As a result they always cheerfully perform any extra duty.

Mr. Towne stated in answer to a question by Professor Wood that he had made 21 contracts, and from his experience the system could be extended to embrace almost any line of manufacturing company. Professor Webb asked whether the system would not have a tendency to make each workman watch his neighbor and note the skill and energy he displayed in his work, and if decidedly incompetent to demand his discharge. Mr. Towne said although this had not occurred at his works, it had been found that the operatives exercised increased economy and care and that the general morale of the force was greatly improved.

The "Comparative Cost of Steam and Water Power" was considered in a paper by Charles H. Manning, the data being drawn from the towns of Lawrence, Lowell and Manchester, on the Merrimac River, which were created by their water-powers. The Lawrence water-power is owned by the Essex Company, who have sold 130 mill-powers. The unit of water-power varies slightly in the different places, that in Lawrence being 80 cubic feet of water per second on a fall of 25 feet, while at Manchester it is 38 cubic feet per second on a fall of 20 feet; the first being equivalent to 85.23 horse-power gross and the latter to 86.36 horse-power gross. Cost per horse-power per annum at Lawrence:

Under original leases.....	\$10.55
Surplus water up to 20 per cent.....	14.51
Surplus water from 20 per cent. to 50 per cent.....	29.02
Under recent leases.....	14.08

At Lowell the cost is:

Under original leases.....	\$10.55
Surplus water up to 40 per cent.....	18.14
Surplus water from 40 per cent. to 50 per cent.....	36.28
Surplus water from 50 per cent. to 60 per cent.....	72.56

At Manchester the cost is:

Under original leases.....	\$10.42
Surplus water.....	7.15

In computing water-powers it is usual to subtract 1 foot from the head as measured from still water. The efficiency of the turbine being taken at 85 per cent. of the net fall, about 75 per cent. of the gross power paid for will be delivered to the shaft. Under the original leases the net horse-power costs \$14. The total cost per net horse-power per annum under the original grants is:

Cost of water.....	\$14.00
Sinking fund, &c.....	7.90
Attendance and supplies.....	.72

Total..... \$22.63

We now come to the steam side of the question. The cost per net horse-power per annum of a compound engine of 1000 horse-power is \$21.16, and the cost per horse-power for a single-cylinder engine, the exhaust steam from which is used at a pressure of about 10 pounds above the atmosphere for other than power purposes, is \$14.58.

D. W. Robb described "The Old Locomotive 'Sampson'" in an illustrated article which we shall publish in an early issue. The discussion of these two papers did not bring out any facts of general interest.

## THE LEAD HEARING

(From Our Washington Correspondent.)

(By telegraph to The Iron Age.)

At 10 o'clock this morning about 50 gentlemen, representing the different interests involved in the importation, mining, smelting and handling of lead ores, gathered in the office of the Assistant-Secretary of the Treasury to present their conflicting views. Secretary Windom occupied a seat by Assistant-Secretary Tichenor, who had charge of the hearing. Among those present were ex-Secretary of War George W. McCrary, representing the Board of Trade of Kansas City; Delegate Thos. H. Carter, of Montana; Senator Wolcott and ex-Gov. J. B. Grant, of Colorado, representing the Omaha and Grant Smelting and Refining Company; George H. Loker, Jr., of the St. Louis Smelting and Refining Company; D. Sheedy, of the Globe Smelting and Refining Company; R. Myer, Kansas City Smelting and Refining Company; Mayor Van B. DeLashmuth; Mr. Shepherd, of New York City, and Joseph McCammon, of Washington, D. C.; ex-Governor Hauser and Russell Harrison, of Montana; C. W. Bennett, of Utah; ex-Minister Foster, of Mexico; ex-Senator Conger, Messrs. Caswell and W. G. Vanhorn, of New York.

Delegate Carter, of Montana, opened the subject by going into a technical dissertation upon the relations of lead to silver in ores, and drawing a deduction that, while silver found in ores was not in sufficient quantities to justify mining and smelting, it afforded a small margin of profit to help out on the general results. He read certain official decisions of the Treasury, claiming that classification should be in accordance with the preponderance of metal in the ore, and not the component metal of chief value. He did not believe in putting lead ore on the free list because it contained other more valuable minerals which were free. The lead ores of Mexico are admitted free as silver ores because analysis shows silver in excess of value. This, he claimed, was unjust to home interests. He cited a decision in 1888, which ruled that when silver was the ore of predominating value it was subject to free entry as silver ore, and when lead was the chief value should pay a duty of 1½ cents a pound. He objected to this. He also dwelt upon the report of the United States Senate Committee on the Judiciary, which was to the same effect, and which he thought did not treat the question in its proper light. He said: "The matter at issue is the free importation of Mexican lead ores. Under a ruling of the Treasury in 1884 all ores in which the value of the precious metals exceeds the value of the base metal are allowed free entry as precious ores. Lead and lead dross are dutiable at 1½ cents per pound. But by this ruling lead ores are practically duty free. The Treasury returns show that the importation of dutiable lead ores from Mexico has almost ceased. Yet it is coming in by the train-load, with a sprinkling of high-

grade silver on top, to give it an appearance of legality. Silver is found in carbonates and with galena, from which lead is obtained. The Treasury is not only being robbed outright and American mines seriously injured by this free importation, but the methods adopted in making the tests are wrong. Instead of pulverizing the ore in a body and getting an even sample to test the comparative value, lumps are taken at random and tested. Ore from the same vein runs unevenly, so a sample may be taken which will show 500 ounces of silver to the ton, yet by the other test the silver would average less in value than the lead. But we are anxious that all lead should pay the duty. Mexican mines are run with low-priced labor, against which our highly-paid mines cannot compete." Mr. Carter stated that but 1263 pounds of lead ores paid duty in one year, while 1,443,000 pounds were imported, defrauding the Government of duty to the extent of 1½ cents a pound.

Senator Walcott said the question was not one of interpretation of law, but, first, what is lead ore. All ores carrying over 5 per cent. of lead are lead ores. Outside of the ores of Iowa, Illinois and Missouri there are no ores in the world which do not carry silver. The Senator asked four hours to present their case and testimony, the same to be given the other side.

Judge McCrary for the opposition to the producers took the floor. He said that they were not here to legislate nor to usurp the powers of Congress, but simply to ascertain the intentions of Congress. The question, he said, has been so often decided by secretaries and the Judiciary Committee of the Senate that there should be no doubt on the subject. Secretary Sherman decided in 1880, before the act of 1883 was passed, that the value of silver in the ore should determine the classification, and if silver predominated in value the ore was subject to free entry. This, he said, is an old rule. Assistant-Secretary Fairchild decided it in 1886. The Director of the Mint passed on it in 1888, and others the same. The parties then went to Congress to ask a resolution of the Senate, and in 1888 the same ruling was sustained by a unanimous report from the Senate Committee on the Judiciary. Judge McCrary said that there was no instance where the Secretary of the Treasury has reversed a decision so strongly intrenched, and further that money was invested on the faith of those decisions. He then showed that the statutes provide in one paragraph for duty on three kinds of ore—lead ore, at 1½ cents per pound; nickel in ore, 15 cents on nickel contained therein, and copper in the form of ore 2½ cents on each pound of fine copper therein. He said the framers of the law knew what they were about, and if they intended to draw the line between lead and silver in the same ore they would have done so. The ex-Secretary's argument was brief, but laid down the principles which should govern the Department in dealing with the questions in very clear terms. Secretary Windom paid close attention. Delegate Carter's presentation of the case from the miners, and Judge McCrary for the importers and consumers of Mexican ores, represent the case as it will be discussed. Mr. Caswell and Mr. W. G. Van Horn, of New York, followed in favor of the home producers.

The hearing then closed until to-morrow.

The new steel ferry-boat Pierrepont, for the Union Ferry Company, of Brooklyn, launched from the ship-yard of Thomas S. Marvel & Co., at Newburg, on Saturday, is 209 feet long, 37 feet beam and 16 feet depth of hold. If the new vessel works satisfactorily the company will build two more of steel.

## Bessemer Steel.

### Its Composition for a Variety of Uses.

Robert W. Hunt, of Chicago, some time since delivered an address on the manufacture of Bessemer steel before the Franklin Institute at Philadelphia. It has just been printed in the *Journal* of that society, and contains the following results of a particularly valuable series of investigations:

I believe now, as I have always, that the more nearly you can have metal composed of only iron and carbon the closer you will be to the ideal. Unfortunately, in this, as in many other human matters, we cannot attain that sublime altitude, and so must be content to do the best we can with that which is vouchsafed us. If we can make one impurity offset the bad effects of another, we will accomplish the results which will be more orthodox in the metallurgical than the religious world. As we are forced to put up with the presence of silicon, sulphur, phosphorus and manganese, we must endeavor to compel as many of them as possible to be our allies. Leaving phosphorus out of consideration, we will first consider the effects of silicon. This element is recognized as valuable in rendering steel castings sound or free from "blow-holes," but has been generally regarded with disfavor by other steel makers. I do not fully agree with them in this condemnation when other than the very soft or high phosphorus metals are considered. Some years ago I made quite a full investigation of the composition of various steels of approved brands, and which had given satisfaction to many users for various purposes. I was particularly interested in my silicon results, and I herewith present some of them.

[We have tabulated the analyses given by Mr. Hunt as follows:

Steel for	Carbon	Silicon	Phosphorus	Manganese
1. Planters' hoes.....	0.76	0.136	0.069	0.441
2. Scarf steel.....	0.52	0.150	0.068	0.406
3. Circles and plungers for rifles.....	0.66	0.171	0.067	0.416
4. Machine screws.....	0.46	0.223	0.066	0.376
5. Hoes.....	0.61	0.158	0.086	0.445
6. Pitchforks and large forks.....	0.63	0.241	0.073	0.610
7. Planters' hoes.....	0.52	0.150	0.043	0.376
8. Gooseneck hoes.....	0.53	0.249	0.040	0.413
9. Spring steel, Jenks' English.....	0.64	0.145	0.088	.....
10. Spring steel, Jenks' English.....	0.52	0.150	0.060	0.06
11. Spring steel, Graves' Swedish.....	0.53	0.110	0.030	.....
12. Spring steel, Graves' Swedish.....	0.76	0.84	0.018	0.065
13. Spring steel.....	0.65	0.185	0.102	.....
14. Hatchets.....	0.70	0.270	0.041	0.195
15. Swords.....	0.64	0.268	0.017	0.453
16. Scythes (German steel).....	0.63	0.127	0.056	0.212
17. Cutlery, knife.....	0.51	0.180	0.029	0.265
18. Fork.....	0.49	0.365	0.030	0.444
19. Cutlery.....	0.61	0.310	0.045	0.402
20. Tool.....	0.66	0.220	0.023	0.140
21. Tool.....	0.65	0.204	0.022	trace.
22. Tool.....	0.65	0.190	0.022	0.174
23. Tool.....	0.66	0.216	0.030	0.091

No. 1 and 2, Lane, Gale & Co.; 3, Providence Tool Company; 4, Hartford Machine Company; 5 and 6, Huntly & Babcock, Utica, N. Y.; 7 and 8, Remington; 13, Naylor's, Bridgeport, Conn.; 14, Johnsville Axle Works; 15, Ames & Co.; 16, stock used by A. S. Millard; 17 and 18, Landers, Frary & Clark, New Britain, Conn.; 19, 20, 21 and 23 made by Park Brothers; 22, Frith's English.]

I have before related that while I was making these investigations, and at the same time endeavoring to produce in the Bessemer converter steels to take the place of those, or as it was apt to be commercially put, "fill the bill at a less cost," I made a visit to the works of a firm, the members of which were and are highly esteemed by me, and whose products of the higher grades of steel have the very highest reputation. These gentlemen have always been

progressive, and therefore their utterances are not likely to be controlled by prejudice; hence carry with them great weight. On the occasion of my visit I was full of what I was accomplishing in my converter. They treated me kindly, but said I must not expect too much. That in making the harder steels I would find silicon my constant enemy. As they happened, while we were talking, to be testing a piece of their own steel which was yielding splendid results, one of them said to me: "My dear fellow, when you can make such steel as that in your Bessemer converter we will begin to believe in it." I was thrown into a depressing state of humility and could with difficulty muster courage to beg a piece for analysis. It was most cheerfully given. The result was:

Carbon.....	0.86
Silicon.....	0.306
Phosphorus.....	0.016
Manganese.....	0.196

About this time several American makers of rifles and pistols were filling European contracts for both the Russian and Turkish governments. Most of them were using foreign iron and steel, the iron being of special brand known as Marshall. Supplying the requirements of these firms presented a tempting field, and we devoted ourselves to it. It did not prove such an easy matter as we fondly hoped, and it was only after numerous trials and some failures that we attained success. But we soon learned that to give a satisfactory gun-barrel steel the manganese must be kept somewhat low. Increasing it might make the steel sound and roll well, but it also caused it to throw a long chip before the drilling tool. This was very objectionable, as such chips would throw the necessarily long and slender drills out of line, and thus cause them to run to one side of the rifle-barrel. A very satisfactory metal had the following composition:

Carbon.....	0.29
Silicon.....	0.212
Phosphorus.....	0.048
Sulphur.....	0.065
Manganese.....	0.370

It is well known that manganese has a strong influence on the tempering characteristics of steel. Therefore it must not be in excess in any metal which will be tempered. It causes water-cracks and other undesirable qualities.

### Lower Eastern Freight Rates.

The Philadelphia *Press* reports that the railroad companies have taken action on the complaints made by the pig-iron manufacturers that the freight on raw material was too high, and at a meeting held recently in New York it was decided to decrease the price for hauling Lake Superior ore or iron ore from Buffalo from \$1.75 to 1.55 per ton—a reduction of 20 cents per ton—for every ton shipped. It is only within a few days that the freight agents of the various railroad companies would listen to talk of a reduction in the tolls, but when the Thomas Iron Company made its cut last week, giving as the reason that the Southern furnaces were treated better by the railroads than the furnaces North, and that at the present prices it was impossible to compete with them, they realized something must be done. The day following the Thomas Company's announcement the Pennsylvania Railroad sent out agents to several of the leading pig-iron and steel manufacturers to get information as to the advisability of making a reduction. The agents were all met with the same answer: "The freight on raw material is too high," said the iron men, "and we cannot make money at the present prices charged." The agents reported and a meeting of the general freight agents was called in New York, with the result stated.

The meeting was not altogether harmonious in more ways than one. Several

of the roads were opposed to the reduction, but one of the agents said: "We intend to reduce the price on iron ore whether you do or not." This made a sensation, and after various plans were submitted the reduction was agreed to. The Reading Company were the first to enforce the new rate, for no sooner had it been made than they issued orders that it would go into immediate effect. They formerly charged \$1.75 per ton for ore shipped from Buffalo to the furnaces on their line, but now the rate is \$1.55. The ore is first taken at Buffalo by the Erie road, then to the Lehigh Valley road, which carries it to Bethlehem, where the Reading takes it to destination. The reduction applies to ore shipped to all furnaces along the line of the Reading. The Pennsylvania Company, it is understood, sent notice to all agents that the reduction would go into force at once. Several other roads have not yet made the reduction, but it is expected they will do so this week.

### PERSONAL.

A. F. Raveret, formerly assistant superintendent of the M. C. Bullock Mfg. Company's works, at Chicago, has accepted the position of assistant superintendent of the Union Foundry and Machine Company, at Los Angeles, Cal. On the 11th inst. the officers and employees of the former company presented Mr. Raveret with a gold watch and chain, the presentation speech being made by F. H. Brown, foreman of the erecting floor.

Andrew Carnegie, the well-known iron and steel manufacturer, was in Pittsburgh for several days last week for the purpose of inspecting the various iron and steel plants in that city in which he is interested. Mr. Carnegie sailed for Paris yesterday to attend the exposition and to secure statistics concerning trade and commerce in the South American States. He thinks that in Paris he can easily procure all the information necessary to prepare him for his work as a member of the South American Commission.

Ladenburg, Thalmann & Co., bankers, of 46 Wall street, announce that Richard Limburger has become a partner of the firm, which now consists of Adolf Ladenburg, Ernst Thalmann, Richard Limburger, the estate of A. Limburger as general partners, and Gerson von Bleichroeder, of Berlin, as special partner, who has contributed \$400,000 in cash. Karl Thalmann and Paul Lichtenstein sign by procuration.

G. W. Maynard, of New York; W. D. Cogswell, of Syracuse, and A. M. Shook were members of a party who have left for a brief trip to the New River District, Va.

Among the passengers departing by the City of Paris are Robert T. Lincoln, United States Minister to England; Allen Thorndike Rice, Minister to Russia, and Captain Zalinski, U. S. A., who will be military attaché to the United States legation in St. Petersburg.

Ex-Mayor Hewitt says he is in England to look into matters connected with the manufacture of steel, more particularly the basic process of making open-hearth steel.

Thomas F. Gilroy, Mayor Grant's appointee for the office of Commissioner of Public Works, took possession regardless of objections, under a decision of the Supreme Court.

Owners of junks on the upper Yangtse fiercely oppose the introduction of steam navigation, blockading the stream against any advance.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, May 18, 1889.

**Pig-Iron.**—Furnace agents report a slight increase in business in some quarters, with negotiations in progress for considerable quantities of both Coke and Charcoal Iron. Buyers are endeavoring to use the late reduction made by the Thomas Iron Company in the East as a club to knock prices lower here, ignoring the fact that Pig-Iron has for some time been sold lower in this market than the new rates made by that company. Prices were depressed more rapidly in the West than in the East, making Chicago for the past few months the cheapest of the strictly Northern Iron markets. It would be unreasonable to expect a further decline to correspond with the \$1.50 cut made by the Thomas Iron Company. Quotations are practically unchanged, ruling about as follows for cash, f.o.b. Chicago: Local Coke Iron, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, \$16.50; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16; No. 2 Foundry and No. 1 Soft, \$15.25; No. 3 Foundry, \$14.75; Gray Forge and No. 2 Soft, \$14.25; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

**Bar-Iron.**—The situation is about the same as it has been, both mill agents and jobbers reporting a very light demand. Carload lots of Common Iron are quoted at 1.60¢ @ 1.65¢, half extras, f.o.b. Chicago, while small lots from store sell at 1.75¢ @ 2¢, according to quantity and quality. The mills are trying to get an advance of 1¢ over present prices for deliveries between the 1st of July and the 1st of October.

**Structural Iron.**—Very few large contracts have lately been on the market, but small orders have been so numerous that the mills are making heavy shipments this way, particularly of Beams. Carload lots from mill are quoted as follows, f.o.b. Chicago: Universal Plates, 2.15¢ @ 2.20¢; Angles, 2.10¢ @ 2.15¢; Tees, 2.50¢ @ 2.55¢; Beams and Channels, 2.90¢. Angles from store are held at 2.25¢ @ 2.30¢; Tees, 2.65¢ @ 2.70¢; Beams, 3.4¢.

**Plates, Tubes, &c.**—The boiler-makers are beginning to pick up orders, and have considerable business in sight, so that a better feeling prevails in this line. The Plate mills are stiffening on Iron, but are not quite so firm on Steel. The Wrought-Iron Pipe trade is quite active, and prices were advanced on Thursday. Store prices are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 57½ ¢ off for 1½-inch and less and 62½ ¢ off for 2-inch and larger.

**Sheet Iron.**—The impression is growing that the supply of Black Sheets will hardly be equal to the demand, so many mills having already sold all they can make for the balance of the year, while inquiries continue to pour in. Common, No. 27, is quoted at 2.85¢ @ 2.90¢ at mill; guaranteed to corrugate, 15¢ per 100 lb advance. Store lots of Common, No. 27, sell at 3.10¢ @ 3.30¢, according to quality.

**Galvanized Iron.**—Manufacturers' agents have had a lively trade in small

lots, but prices are as low as ever. Small quantities are quoted at 65 ¢ off for Juniata and 65 ¢ and 5 ¢ off for Charcoal.

**Merchant Steel.**—The trade of the past week was very fair, including some good-sized orders for Tool Steel. No heavy contracts have come forward as yet, but the market is well sustained by the flow of small orders, and prices are about the same as they have been, viz.: Soft Steel Bars, 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢; Sheet Steel, 7¢, 8¢ and 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Steel Rails.**—A very satisfactory movement is reported in small lots, ranging from 250 to 1000 tons, and originating principally in the Far West and Northwest. The demand for Light Rails has been a noticeable feature of the trade. They are wanted for mine use, for lumber roads and for the construction of feeders to main lines in sparsely settled districts. A couple of large orders are the subject of negotiation at present, and a very hopeful feeling is expressed that by June a much more active market will be experienced. An encouraging indication for the future is the successful sale of bonds by a new railroad company, who will require from 20,000 to 25,000 tons of Rails. Although this particular project lies outside of the territory reached by the Chicago mills, it is accepted as evidence that other new railroad schemes can be financed which will draw their Rail supplies from this quarter. Prices have been irregular for some time, depending upon the extent of competition from other mills, the adjustment of freight rates, &c., but a stiffer feeling now obtains among sellers, and they are endeavoring to work prices upward. The regular quotations for Standard Rails for strictly Chicago delivery are still \$29.50 @ \$30.

**Track Supplies.**—A better demand for Spikes is noted, but generally speaking the market is very quiet. Small lots are quoted as follows: Steel Fish-Plates, 1.90¢; Iron Fish-Plates, 1.75¢; Bolts with Square Nuts, 2.55¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.95¢ @ 2¢.

**Old Rails and Wheels.**—Sales of moderate quantities of Old Iron Rails at interior points are reported at \$20. Holders ask the same price here, but the best bids brokers have been able to get from consumers would only equal \$18.50 at Chicago. Old Car-Wheels are quiet. Quotations are nominal at \$16 @ \$17.

**Scrap.**—Small quantities of Old Material have been sold to consumers, but the bulk of the transactions now in progress consists of purchases by dealers. A little better demand for Steel Scrap than Iron is noted. Dealers quote to consumers as follows: 1 ton of 2000 lb: No. 1 Wrought, \$17 @ \$18; Track, \$17 @ \$18; Axles, \$22; Horseshoes, \$17; No. 1 Mill, \$18.50; Cast Machinery, \$12 @ \$12.50; Stove Plates, \$9; Cast Borings, \$8; Wrought Turnings, \$11.50; Axle Turnings, \$12.75; Mixed Steel, \$10.50 @ \$11; Coil Steel, \$13.50; Leaf Steel, \$15.

**General Hardware.**—It is commonly remarked that the course of the Hardware trade this spring has been very peculiar, fluctuating widely from week to week and often from day to day. The demand has been of a spasmodic character, making business very active for a time, to be followed by decided quietness. Just now there is a little spurt of activity. Taking the entire spring, however, the volume of business is reported by the leading houses to have been about equal to that of other years. Apprehensions of drought were beginning to be felt throughout a large part of the West, but they were dispelled last week by refreshing rains, and traveling salesmen now send in most encouraging reports of trade prospects.

**Nails.**—Manufacturers' agents have had a fair run of inquiries for Steel Nails, and have made moderate sales, with prices ruling a fraction better for the mills than during previous weeks. Wire Nails are firmer, jobbers reporting an advance in the cost to them of at least 5¢ per keg on recent purchases, and they are now instructing their salesmen to endeavor to secure better prices also. Small lots of Steel Nails are still quoted at \$1.95 @ \$2 and Wire Nails at \$2.35 @ \$2.40, with 5¢ off for mixed carloads.

**Barb Wire.**—Jobbers are pushing the manufacturers for more prompt deliveries on their contracts, not being able to fill orders fast enough, yet prices are as low as before, namely, \$2.75 @ \$2.80 for small lots of Painted and \$3.35 @ \$3.40 for Galvanized.

**Pig-Lead.**—Relative to the course of the market at the several Lead centers during the past week, Everett & Post say: "At the opening higher prices were quickly established and each day witnessed a still further stiffening of values until the middle of the week, when, for the moment, the upward movement seems to have ceased. A noticeable feature is that most of the buying has been done for speculative interests, while consumers generally are holding aloof. It is hard to give the exact cause of the recent 'boom,' but probably the chief reason is to be attributed to the Secretary of the Treasury, who has appointed the 15th inst. for the hearing of pros and cons on the Mexican Silver-Lead Ore question. Should it then be decided not to change the present ruling the metal would undoubtedly react to a much lower basis; while if, on the other hand, the Treasury Department should decide to no longer admit these Ores free of duty, then a considerably higher range of values might soon be expected. The recent upward movement has been helped along by a considerable short interest in New York and elsewhere, and also a large demand for Spot Lead; at the same time, most of the refiners are well sold up for May and June delivery and are unable to take advantage of the present advanced rates. The Chicago market, opening at 3.60¢, has kept in line with New York, and though no large sales were made values have been firm. At the close we call the market 3.75¢, with sales of some 200 tons at that."

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., May 14, 1889.

**Pig-Iron.**—Now that things have settled down a little after the break made by the Thomas Iron Company, it is possible to take a reasonably correct view of the position. In doing so it is found that one or two brands that were selling at \$17.50 for No. 1 are now available to good buyers at \$17, but the majority have made no changes whatever. Those who were getting \$18 are still holding for \$18; those who were down to \$17 before the Thomas reduction still remain at that figure and say they see no reason why they should change. A reduction in the cost of Ores, however, may induce some of these parties to shade a little on Pig-Iron, but they are not doing it at present, as there is no accumulation of good Iron, and their action will depend more on what the demand may be in the near future than on any arbitrary figure which may be named by those controlling other makes of Iron. As to the probabilities, it is pretty hard to say what may be done. Owing to the reduction in cost, as we have said, prices could be shaded without placing sellers in any worse position than they were in before, but when things are in the miserable condition that they have been in during the past six months it is improve-



ment they want, and not to be satisfied because they are no worse off. Still, there is some comfort in that, considering all the terribly bad things which have been predicted during the past few days. Apart from outside influences, it is almost certain that this market would easily develop into higher prices, but it depends on the amount of overflow from the South and West. Advices from these points are not encouraging, and it is understood that Western buyers are not willing to continue at the prices ruling during last month. It is just possible that they may have been unduly frightened at the "dollar-and-a-half drop," but whatever may be the cause, it is stated on good authority that buyers at the points named are standing out for concessions, and that business in large lots cannot be closed to-day unless at more or less of a reduction in price. This, if persisted in, leaves the Eastern market open to a further attack from the South, although at the moment there is nothing offering below last week's prices. But the law of supply and demand will assert itself, and this is what the trade are waiting for. If consumers must have Iron, prices will be sustained; if their requirements are such that they can curtail purchases, prices must decline in spite of all theories to the contrary. It is a waiting market, and at the moment it is impossible to say what the next turn may be, although much confidence is felt in better prices after midsummer. The range of prices for Philadelphia deliveries may be given as follows: Good to choice No. 1 Foundry, \$17 @ \$18; No. 2 do., \$16 @ \$16.50, and Gray Forge, \$14.75 @ \$15.50. Southern Irons and brands new to the market may sell at 25¢ @ 50¢ below the inside rates above named, but it depends on quantity, quality, point for delivery, terms of payment, &c. The Philadelphia Iron trade regards as the worst result of the action of the Thomas Company the establishing of a most pernicious precedent in regard to the binding character of a contract. If a contract is not binding on both sides it is no contract at all, but simply an option. A six or eight months' option on Iron is a very different thing from a contract binding on both sides, and cannot by any means be regarded as a *bona fide* sale until the price is mutually agreed upon. The hardship in this case is not on the customers of the Thomas Company, but on those who made sales in good faith at prices lower than the Thomas, and who are now frequently called upon by their customers for a similar reduction to the Thomas, which is manifestly unjust and totally at variance with correct business principles.

**Blooms.**—Market dull and irregular, but sales are mainly within the following range of quotations: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$35 @ \$36 for Flange, and \$37 @ \$39 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck-Bars.**—Business has not been very active, but with something of a scarcity of good Bars prices are well sustained at \$27 delivered, or \$26 @ \$26.50 at mill, for good-quality Bars. One or two sales of good-sized lots have been reported at \$26.75 delivered.

**Bar-Iron.**—No improvement can be noted in this department, and prices are as low and as unsatisfactory as ever. There is a little more demand probably, but competition is as close as ever; hence the continued demoralization in prices. The approach of hot weather, &c., will doubtless do much to curtail the output, and while there may not be much improvement in the immediate future, there

is little doubt that to-day's prices are about as low as will be seen during the year 1889. Prices are nominally from 1.70¢ to 1.80¢ for Best Refined Bars, but cutting in extras is so general that base prices give very little idea of actual prices.

**Plate and Tank Material.**—The demand is quite active, and mills are running pretty nearly to their full capacity. The volume of new business is quite on a par with the output, but it seems impossible to establish any advance in prices, although they are firmly held at the limits prevailing for some weeks past. The character of the demand is such, however, that manufacturers believe that the time is at hand when an upward movement may be started, as the demand promises to be large during the next three months, while the output cannot be increased very much, although it may be considerably decreased. Prices, therefore, are steady at about the following figures asked: 1.85¢ @ 1.95¢ for Ordinary Plates and Tank Plates; 2.1¢ @ 2.2¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.3¢ @ 3.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.1¢ @ 2.25¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 3¾¢.

**Structural Material.**—There is no special movement in this department, and in most respects the market is just about as it was a week ago. Mills are fairly busy on Shapes, &c., with indications of a considerably better demand in course of a few weeks. Prices about as follows: Bridge Plate, 1.95¢ @ 2.05¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—The demand is very satisfactory, the current product of the mills being taken almost as fast as it is turned out. Inquiries are coming in from all sources, with every indication that the demand will be large all through the season. Prices remain about as follows:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3¼¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3¾¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67½ %

**Steel Rails.**—The market is quiet, although the feeling is somewhat firmer. The unsettled condition of affairs in Pittsburgh is a standing menace to the market, and doubtless will be a barrier to any special movement for the present. Eastern mills quote \$27.50 @ \$28, although it is reported that a sale of 12,000 tons has been made at \$27 by one of the Western mills.

**Old Rails.**—Absolutely no business in this market. There are buyers at \$22 for T's, but holders quote \$22.50 and upward, some as high as \$24.

**Scrap-Iron.**—There is very little change in Scrap, although consumers contend for lower prices, but the supply being small prices are fairly maintained at about the following quotations: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—There is an increasing demand, and prices are firmer, as shown by the following discounts: Butt-Welded Black, 52½ %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52½ %; Boiler Tubes, 60 %.

**Nails.**—The demand has fallen off somewhat, although the movement is still considerable. Prices are nominally unchanged, but extremely low figures are mentioned in the case of sales to realize cash. Standard brands command about \$1.80 @ \$1.85 in carload lots, and \$1.90 @ \$2 from store.

Jas. G. Lindsay & Co., Bullitt Building, Philadelphia, are now the representatives of the Duquesne Forge Company (formerly Miller Forge), Pittsburgh, Pa.; also the general agents for the Garry Iron Roofing Company, of Cleveland, Ohio.

## Cleveland.

CLEVELAND, May 13, 1889.

**Iron Ore.**—The best authorities agree that the total sales of Lake Superior Ore to date amount to not less than 3,250,000 tons, almost a million tons of Ore having been sold during the past week. Included in the heavy orders placed during the past six days were several round lots of No. 1 Specular and Magnetic Ore, non-Bessemer quality, at \$4.75 @ \$5. Cleveland delivery; a substantial amount of Gogebic Bessemer Ore at \$5; considerable Bessemer Ore from the Menominee Range at \$4.90 @ \$5.10 and a large number of orders for Non-Bessemer Hematites at about \$3.75, f.o.b. vessels, Cleveland, Ashtabula and Buffalo. The market is certainly active and the amount of Ore sold during the week just closed closely approximates a million tons. Every mining company represented in this city reports heavy orders at about the same quotations furnished *The Iron Age* last week. Ore is being pushed down from Ashland, Two Harbors, Marquette and Escanaba at a tremendous rate, 22 vessel-loads arriving yesterday and the total receipts of the past seven days aggregating not less than 60,000 tons. The mine owners are experiencing no trouble in engaging plenty of tonnage at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland and Two Harbors. The heavy buyers at Pittsburgh have thus far made only scattering purchases, but the Ore men profess to be indifferent to this situation, claiming that they are having all the orders their clerks can place on the books, and that the present prices for Ore will unquestionably be the season's quotations. This claim may be subject to doubt from the fact that in July and August of 1888 the market declined from 25¢ to 40¢ per ton upon all grades of Ore, and something equally favorable to the purchasers may occur this year. Furnacemen argue that this is likely to come about, because of the comatose condition of the Pig-Iron market, and because, too, lake freights are much more favorable to shippers than was the case last year. Representatives of the very highest grades of Bessemer Ores claim additional sales amounting to 12,000 or 15,000 tons at \$6.25, Cleveland delivery, and of Minnesota Bessemer at \$5.75. The following are the quotations, f.o.b. vessels, Lake Erie ports:

Specular and Magnetic Bessemer Ores.....	\$5.75 @ \$6.25
Specular and Magnetic Non-Bessemer Ores.....	4.50 @ 5.00
Red Hematite Bessemer Ores.....	4.50 @ 5.00
Red Hematite Non-Bessemer Ores.....	3.50 @ 4.00
Menominee Range Bessemer Ores.....	4.90 @ 5.10
Menominee Range Non-Bessemer Ores.....	3.50 @ 4.00
Gogebic Range Bessemer Ores.....	4.90 @ 5.25

**Pig-Iron.**—Dealers are encouraged by the increased demand for Wire-Rods, necessitating, of course, an improvement in the inquiry for Blooms and Billets. The market certainly retains the hopeful features of last week, a result due in some degree to the existing demand for Bessemer Iron, at which an offer of \$16 for 10,000 tons at the furnace was refused during the week just closed. Prices for Iron are rigorously

guarded, but that a considerable quantity is being sold is evident from the reports of the amount of Iron going into consumption, and also to the fact that there is little or no accumulation of stocks at the yards. The following are the quotations:

Nos. 1 to 6 Lake Superior Charcoal.....	\$20.00 @ \$21.00
No. 1 Strong Foundry, Bessemer quality, $\frac{1}{2}$ ton.....	16.50 @ 17.00
No. 1 Strong Foundry, $\frac{1}{2}$ ton.....	16.00 @ 17.00
No. 2 Strong Foundry, $\frac{1}{2}$ ton.....	15.00 @ 16.00
No. 1 American Scotch, $\frac{1}{2}$ ton.....	16.50 @ 17.00
No. 2 American Scotch, $\frac{1}{2}$ ton.....	15.50 @ 16.50
No. 1 Soft Silvery, $\frac{1}{2}$ ton.....	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, $\frac{1}{2}$ ton.....	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, $\frac{1}{2}$ ton.....	14.50 @ 15.50

**Old Rails.**—Old Americans are still weak at about \$20.50 @ \$21, and with only a few scattering sales reported. Old Wheels are to be had in plenty almost at buyers' prices.

## St. Louis.

Office of *The Iron Age*, 212 N. Sixth st.,  
St. Louis, May 13, 1889.

**Pig-Iron.**—For some reason business holds off. Orders are scarce and when placed are generally for small lots. This city is amply supplied with Pig-Iron agents and the competition to secure what little business there is is consequently very active, and naturally prices are shaded to secure trade, and agents appear willing to concede part of their commission to secure some business for the furnaces they represent. This is a feature that just at the present time is particularly objectionable. If the agents would be satisfied to name a fair price and abide by it, taking their regular commission, it would be far more advisable than following the course they are at present pursuing, especially so just at this time, as the market is certainly in a very depressed condition, although there appears to be considerable confidence as to the future; in fact, more than the actual condition of things seems to warrant. During the week some few sales were entered, in 200 and 300 ton lots, made up of different grades. Under the circumstances prices are holding very well, and notwithstanding the dullness prices seem to be held with some degree of strength. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$15.50 @ \$16.00	
Southern Coke, No. 2 Foundry, 15.00 @ 15.25	
Southern Coke, No. 3 Foundry, 14.50 @ 14.75	
Gray Forge.....	13.50 @ 14.00
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	20.50 @ 21.50

### Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

### Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.

**Bar-Iron.**—The improvement noted last week continues, and it now looks as if some advance in prices will be made shortly, as it is reported that the mills which were known to be cutting prices are about filled up with orders, and the stronger concerns who held off and only took what business as was actually necessary are in the market to sell, but not at the extreme quotations that prevailed during the first three months of the year. Small lots from store are quoted at \$1.80, and carload lots from \$1.60 to \$1.70, according to circumstances.

**Barb Wire.**—There is an active demand for Wire, and prices show more strength. The prospect of any combination among the manufacturers seems to be as distant as ever, as it is understood that there are two or more concerns that will not enter the combination under any circumstances. But aside from the combination there seems to be some prospect of

improvement in prices, but how soon it is difficult to tell. There is a growing disposition among manufacturers to discontinue taking orders to be delivered, and if possible sell all goods f.o.b. St. Louis. If this could be accomplished it would prove quite a saving to the manufacturers, as they are compelled to pay freight on the wooden spools, which is a complete loss to them. One manufacturer during the past week refused a carload order on account of this feature. Whether the other manufacturers will take the same stand remains to be seen. Mills quote from \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized. Carload lots are quoted at from \$2.70 to \$2.75 for Painted and \$3.80 to \$3.35 for Galvanized, f.o.b. St. Louis.

Continental Wire Company have removed their office from 409 North Third street to Laclede Building.

Wolfe & Good, manufacturers' agents, have removed their office from 411 North Third street to Laclede Building.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,  
CINCINNATI, May 13, 1889.

A tour among the local Iron agents and factors was but lightly rewarded to-day, the general report for the week being small sales and unsatisfactory prices. Traveling men from the South bring more discouraging facts than reassuring news, from Alabama at least. The foundries in that section are selling at ruinously low prices; others are looking for more favorable localities. In the North, parties who have made large contracts in some instances are asking a postponement of deliveries, reflecting a falling off or a cancellation of orders. Rolling-mills are especially dull. On the other hand, Pipe-works continue to melt heavily, and some Car-works in the West have been fortunate in securing larger contracts, on the strength of which Cincinnati has been enabled to sell 800 tons Lake Superior Car-Wheel Iron on a basis of \$20.25, cash, here, but this is the only sale of moment recorded. At the moment bids are in for 1500 to 2000 tons No. 8 Foundry and Gray Forge, and the award will probably be made to-day or to-morrow. The open prices quoted for Gray Forge and No. 3 Foundry are \$13 and \$13.25 respectively, and the inference is that these prices can be shaded 25¢ on such a market. Even the run of small orders is becoming lighter.

**Manufactured Iron.**—The rainfall during the past few days has much improved the agricultural outlook in this section, but more moisture is necessary to restore the crops to a normal condition. In the North and West rain has been ample. It is only in the Central West that there has been much apprehension. General business has not yet received the stimulus anticipated, and orders for Manufactured Iron reflect dullness more than any other condition, and an easy tone prevails. The following are the approximate prices current here at the close, for cash, f.o.b.:

### Foundry.

Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.00 @ 14.50
Southern Coke, No. 3 (new classification).....	13.25 @ 13.75
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley Hanging Rock Charcoal, No. 1.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 2.....	20.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 2.....	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2.....	16.50 @ 17.00

### Forge.

Strong Neutral Coke.....	12.75 @ 13.00
Mottled Neutral Coke.....	11.75 @ 12.00
Gray Forge.....	12.75 @ 13.00

### Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 24.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.00 @ 21.00

**Nails.**—There has been a fair order trade and a steady market for all kinds; 12d @ 40d sell at \$1.90 @ \$1.95  $\frac{1}{2}$  keg, with 10¢ rebate in carload lots at the mills. Steel Nails sell at \$1.90 @ \$1.95, and Steel Wire Nails at \$2.45 @ \$2.50  $\frac{1}{2}$  keg.

**Old Material.**—There has been an improved demand for Old Rails at \$20 cash, but holders have refused to sell under \$21. Old Wheels have been neglected and prices have remained nominal at \$18, spot cash, here.

W. H. D. Totten, Jr., the Western representative of Messrs. Carnegie, Phipps & Co., of Pittsburgh, Pa., has secured quarters in the Michell Building, adjoining the new Chamber of Commerce. Mr. Totten, although representing the firm mentioned but a few months in Cincinnati, has succeeded in building up a very satisfactory trade for the productions of the company.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,  
CHATTANOOGA, May 13, 1889.

**Pig-Iron.**—The market continues in about the same quiet condition that has prevailed for the past two or three months. The cut of the Thomas Iron Company, so far as can be ascertained, has not created even a ripple in prices. It certainly has not affected prices, as small round lots are now being sold to go to the Eastern markets at about the same prices that prevailed before the announcement. Taking the whole condition of the market into consideration, prices have receded but very little during the last month. Good grades of favorite and well-known brands are as closely sold up as the furnaces care to go, and the constant demand and inquiries go to show that these special Irons will continue to find a market. Grades that are a little off, or not as well known, are of course being sold at conceded prices. Iron producers are now taking no other position than that the market is down as low as it will get any time in the future, and are simply holding on for something to "turn up," or some other turn. Some say that they are making some money, which is probably so; others say they are losing nothing, which may also be true, and under this condition of things all will keep running on. Under a freight rate of \$3.75 from this, as well as the Birmingham district, they still claim the New York and Philadelphia markets. At the same time, the enormous retail trade, as it were, from every consuming point in the United States keeps the prices that they are getting for their output up to something more than what their Eastern markets net them. Large quantities of Nos. 3 and 4, mixed with a little No. 1, are now being used by some of the largest consumers, so that the yards are now well cleared up in those qualities, which leaves the bulk of the Nos. 1 and 2 for the open markets East and to special customers. So far as can be ascertained, none of the furnaces are suffering for orders, and there are a great many offers a little under that are declined.

## Louisville.

LOUISVILLE, KY., May 13, 1889.

**Pig-Iron.**—The market has been very quiet during the past week, purchasers buying in small lots and to meet their immediate necessities rather than for future delivery. A disposition is being shown among a few to buy for deliveries extending throughout the year. Consumers are

recognizing that the price of Iron is extremely low, but are not willing to contract for large amounts until they see the effect of the drop in prices in the Eastern market. It is not felt, however, that there will be any special change in prices among Southern furnaces in this section owing to the action of the Thomas Iron Company, as the drop has been discounted for some time. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.25 @ 16.75
No. 1 Mill.....	14.75 @ 15.25
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,  
Pittsburgh, May 14, 1889.

The general Iron situation remains in much the same condition noted a week ago; in some respects the outlook is favorable, while in others it is not. There is a large volume of business, but prices continue unsettled and unremunerative. Nearly all our mills and furnaces are in operation, but there is very little money in the business at the present time. While consumption is increasing, production continues in the lead.

The strike at the Rail mill of the Allegheny Bessemer Company, at Duquesne, continues, although it is claimed that it is about over, the mills in operation being operated by non-union men, but, the strikers say, with very poor results. However, as stated in this column a few weeks ago, it is the evident intention of the company to make it a non-union mill; and it looks now as if they would be successful. Some of the strikers, it is said, have left the place, which may, if true, be taken as an indication that the back of the strike is about broken.

Mr. Andrew Carnegie, who was here a few days, was interviewed again in regard to his status toward the Pennsylvania Railroad and its discriminations against Pittsburgh. Among other things, Mr. Carnegie said: "I make this prediction, that what we have asked will be granted soon; some of it very soon. First, Ores will be carried from the lakes to Pittsburgh as cheaply as from the lakes to the Ohio furnaces, the distance to the latter being greater than the former. This is the most vital change of all. Second, Coke will be supplied to the furnaces in the Pittsburgh district at the same rates as the Pennsylvania Company receive upon Coke carried to Pittsburgh destined for Chicago furnaces. Third, rates upon all classes of freights, east and west, say to Baltimore, Philadelphia, New York and Eastern cities, and to Chicago and Western cities, will be just one-half of the through rate between Eastern and Western cities. With these fair requests granted I think that every manufacturer in Pittsburgh will change position in regard to the railroads. They will recognize them as their allies and friends and be only too glad to co-operate with them. There may be other equally wrong discriminations in other branches of business of which I have no knowledge."

Word comes from Washington that John Jarrett, a former president of the Amalgamated Association, and Wm. Martin, at present secretary of the same, are to receive consular appointments. The appointments if made will be a source of great satisfaction here to people generally,

but to members of the Amalgamated Association in particular. Both men stand high in this community.

**Pig-Iron.**—There has been an increased volume of business the past week, and just as soon as consumers can satisfy themselves that hard-pan has been touched the demand will be largely increased and the result a stronger market. Consumers generally are low in stock, as they have been buying from hand-to-mouth for some time past, and as soon as the feeling begins to obtain that the lowest notch has been touched all will want to buy, which will be immediately followed by sellers refusing to sell, and up will go prices. Pig-Iron, it is said, with but a single exception, never sold lower than it is at present, and the situation warrants the prediction that there will be an increased demand and a reduced production within the next few weeks. There is no margin for profit at present prices, while the cost of production has been reduced to the lowest possible limit, and a number of furnaces will go out as soon as they get through with existing contracts. We quote prices as follows:

Gray Forge Neutral.....	18.75 @ \$14.00, cash
White and Mottled.....	18.00 @ 18.50, "
All-Ore Mill.....	14.75 @ 15.25, "
No. 1 Foundry.....	16.00 @ 16.50, "
No. 2 Foundry.....	15.00 @ 15.50, "
No. 3 Foundry.....	14.50 @ 14.75, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, 4 mon.
Cold Blast Charcoal.....	24.00 @ 27.00, cash
Bessemer Iron.....	16.00 @ 16.25, "

Sales of several thousand tons Neutral Gray Forge reported at \$18.95 @ \$14, cash, and \$14.25, four months; 2200 tons Bessemer at \$16, cash, which is now the ruling price.

**Muck Bar.**—So far as we can learn there have been no sales below \$26, cash, at which it is offered pretty freely. Offers were made last week to buy at \$25.50 @ \$25.75, cash, but no sellers could be found.

**Spiegel.**—Is still quoted at \$30 @ \$30.50, cash, for 20%. Sale, 300 tons Ferromanganese, 80%, at \$58, cash, and a smaller lot, 77½%, at \$57.50, cash.

**Manufactured Iron.**—The Merchant-Iron trade is more active, but prices continue unsettled and unsatisfactory. We continue to quote upon a basis of 1.60¢ @ 1.70¢ for Bars for first-quality Iron, 60 days, 2% off for cash. Old-Rail Iron is being offered by mills in Mahoning and Shenango valleys at 1.40¢ @ 1.50¢ rates. There is an increasing demand for Skelp-Iron, and some of the mills not only have all they can do for the present, but are sold up until July. No change in prices—Grooved, 1.62½¢ @ 1.65¢; Sheared, 1.90¢ @ 1.95¢.

**Nails.**—There is no change in the position of the market here; trade continues very dull, with but little prospect, apparently, of any immediate movement. We continue to quote Cut Nails at \$1.85 @ \$1.90, 60 days, 2% off for cash, and Wire Nails at \$2.15 @ \$2.20, same terms.

**Wrought-Iron Pipe.**—An important meeting of the Wrought-Iron Pipe Association took place in New York on Thursday last. The attendance was large, proceedings harmonious, and all the mills in the country are now members of the association. It was ascertained that all the mills are busy, some of them contracted for several months ahead, and the indications point to an active trade until the advent of the winter season. Prices were advanced, or, what amounts to the same, discounts were reduced. The new discounts are as follows: On Black Butt-Welded Pipe, 52½¢; on Galvanized do., 45¢; on Black Lap-Welded, 65¢; on Galvanized do., 52½¢; Boiler Tubes, 1½ inches and smaller, 57½¢; 2 inches and larger, 62½¢; 5½ inch casing, 62½¢; other sizes, 60¢; 2-inch Tubing,

13¢ per foot net; 8-inch Line Pipe, 20¢ per foot net; 6-inch do, 56¢; 8-inch do 90¢.

**Old Rails.**—Old Iron Rails continue dull, and prices are weak and drooping; offerings at \$22 with no demand. We are advised of a sale of 1000 tons for delivery at Youngstown at \$21.50. Old Steel Rails continue in demand with but few offering; short lengths are quoted at \$17 @ \$17.25, and long lengths at \$19 @ \$19.50. It is not long since Old Steel Rails were almost unsaleable, while Old Iron Rails were wanted on all sides; now it is the other way.

**Steel Rails.**—Manufacturers still quote heavy sections at \$26 @ \$27, cash, at mill, but it is rumored that orders have been booked below the lowest price quoted. The strike at the mill of the Allegheny Bessemer Company is still in progress, but the company now entertain but little doubt of ultimate success—that is, of making it a non-union mill, which is the main point in the contest.

**Railway Track Supplies.**—There is no change in prices. Spikes, 2¢, 30 days, Splice Bars, 1.60¢ @ 1.70¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

**Blooms, Billets, &c.**—Bessemer Steel Billets and Blooms are quoted at \$27 @ \$27.25, cash; do. Nail Slabs \$28.50. Sale of 1000 tons Rail Crops at \$17.25, cash.

**Old Material.**—Continues very dull, and there is so little doing that it is difficult to quote reliable quotations. We hear of sales of No. 1 Wrought Scrap at \$18 @ \$18.50, net ton; Wrought Turnings, \$12.50 @ \$13; Old Car Axles, \$24 @ \$25; Cast Scrap, \$14 @ \$15.50, gross; Old Car-Wheels, \$18 @ \$18.50.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street,  
New York, May 15, 1889.

**American Pig.**—The Thomas Iron Company report that, as the result of their recent circular, their customers are taking Iron more freely, so that their accumulated sold stock, larger than it was ever before, is likely to be rapidly reduced, especially since additional sales have been made to customers, and some Iron is being sold to outsiders at \$17 for No. 1 and \$16 for No. 2, respectively. There has been some readjustment in contracts made by other sellers. It is well known, too, that some business was closed earlier in the year on the basis of "\$1 below Thomas," which is now less favorable to the furnaces who entered into it. Some of the other Lehigh furnaces have issued circulars quoting \$17 for No. 1 and \$16 for No. 2, while Southern Iron continues to sell at \$16 @ \$16.25 for No. 1 and \$15 @ \$15.25 for No. 1, with rumors of a slight shading of the lower figures, which cannot, however, be traced to any authentic source and should be received with caution. Some of the leading Southern makers who are longer identified with the business are inclined to regard the step of Thomas Iron Company with favor, stating that their worst competitors are not the Northern furnaces, but the new plants in some sections of the South. The most interesting question which has arisen is the effect of the lower prices for Lehigh Irons in New England. Taking Boston for instance, it costs Lehigh and Schuylkill furnaces about \$1.25 to go from New York to Boston. Southern furnaces can get into that port for about 25¢ more than they go for into New York. But as soon as the Iron goes inland they must pay in addition 35¢ for the haul on the belt-line to the cars. The further inland they must go the easier it is for the Northern furnaces to meet them,

especially if, as is probable, the railroads take off the recent addition to freights. Some New England harbors for instance, Portland and Bangor, Me., can be reached by Northern furnaces for \$1.35 over tidewater prices. To Southern furnaces it costs about \$1.50 more. During the past week a lowering of Ore and Coke freights to Eastern Pennsylvania furnaces has been granted, and Anthracite Coal is also to be reduced. We may note the fact that off-grades of Northern Irons are being crowded on the market lately and that prices are lower. We hear of business at \$14.50 on Forge at tide and \$15 on Plain No. 2, with a report of \$13.50 on a small lot of off-grade Forge.

**Scotch Iron.**—The market is very dull, with Coltness nominally \$21.50 @ \$21.75; Summerlee, \$21.25 @ \$21.50, and Dalmington, \$20.25 @ \$20.50. American Scotch is selling at \$19, and is gaining in favor.

**Structural Iron and Steel.**—The contracts for the Ironwork for two office buildings on Wall street were placed during the week, the aggregate quantity of Beams being about 800 tons. We continue to quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Fire-box, 3¢ @ 4¢.

**Steel Rails.**—The conference of Rail-makers did not result in anything that is tangible. As one leading manufacturer put it, "they walked up the hill and walked down again." It was understood that a number of the Eastern mills were in favor of the adoption of some method to fix a price more remunerative than that ruling at present. So far as we are informed, however, no definite arrangement ever came up for discussion. It is stated that the representative of the Pittsburgh mill held that with an active competitor, not one of the association, in his own territory anything which approached an agreement to fix a price is altogether out of the question. The first signs appeared this week of the usual newspaper bear campaign which annually precedes the entrance into the market of a leading railroad interest in the Southwest. Until the great magnate alluded to has purchased all sorts of rumors of low prices are likely to be kept afloat with much ingenuity, but they are not likely to have much effect. We class among them the story which cropped up in Philadelphia that Rails had been sold at \$24.75. So far as we have been able to learn \$26 has been shaded only once by any mill East or West during the past two months, all the talk by outsiders and rival Rail-makers to the contrary notwithstanding. Eastern mills report business, scattered from Maine to the Gulf, of an aggregate of 13,000 tons at \$26.50 @ \$27. In the West only one small transaction, an addition to a larger order placed with a Pittsburgh mill lately, is reported. Prices there are still \$26. Dividing the mills in the association into three groups, the Eastern with the Troy, Scranton, Lackawanna, Pennsylvania and Bethlehem; the Central with Edgar Thomson, Cambria and Cleveland, and the Western with North Chicago, Juliet, Union and Springfield, the report of the Board of Control shows the following for the first four months:

Group.	Sales.	Allotment.
Eastern.....	300,995	583,537
Central.....	222,548	281,280
Western.....	226,521	288,306
Total.....	750,064	.....

The total allotment, which includes one mill not enumerated in the above, is 990,-

850. It should be noticed, however, that the total sales reported, 750,064, do not, of course, include the Allegheny Bessemer Company, whose sales aggregate at least 50,000 tons. Nor does it, of course, include the sales made since May 1. It is estimated by good authority that this will swell the total to 850,000 tons, at least. On May 1, 1888, the sales had been about 721,000, while at the same date in 1887 they aggregated 1,598,048 tons. The shipments from the mills up to May 1 were 343,044 tons in 1889, against 299,556 tons in 1888, and 564,403 tons in 1887. It may be of interest to add that there is an inquiry in the market for 40,000 tons of Rails for an extension into Oklahoma of the Chicago, Kansas and Nebraska Railroad.

**Bar-Iron.**—The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Scrap-Iron.**—Business appears to be at a stand-still, except in very small lots, sellers showing a disposition to stack material rather than sell at the prices offered. We quote: No. 1 Scrap, \$20 @ \$20.50 for cargo lots, and \$20.50' @ \$21 for carload lots, delivered; Turnings, \$13.50 @ \$14; Cast Scrap, \$15 @ \$16; Borings, \$9.50 @ \$10.

**Old Rails.**—These are dull and nominal at \$22 @ \$22.50. No business of any consequence is reported.

**Fastenings.**—Spikes in large lines may be quoted \$1.90 @ \$2 and Angles \$1.70 @ \$1.80, Iron or Steel, delivered.

Naylor & Co., of 99 John street, New York, the Bullitt Building, Philadelphia, and Lewis Block, Pittsburgh, announce that they have made arrangements to supply with Ore Isaac McHose & Sons, of Norristown, Pa., and to take the sale of the special low phosphorus Pig-Iron known as Acme, which is guaranteed phosphorus not to exceed 0.03, sulphur not exceeding 0.03, and silicon 1 to 2 per cent. Isaac McHose & Co. publish daily determinations of phosphorus of the Acme for April, which shows a maximum on only two days of 0.028 phosphorus, the lowest being 0.022. They expect to make a limited quantity which they can guarantee 0.02 and under in phosphorus, which they call Special Acme.

Wetherell Bros., Steel merchants, agents of the La Belle Works, of Pittsburgh, and the Carlisle Works, of Sheffield, England, have moved their New York office to 93 Liberty street.

## Financial.

The course of events affecting trade, taken as a whole, is pronounced favorable, the drawbacks being only occasional. Confidence in the future seems to be well grounded. The fact is construed favorably that despite considerable exports of gold in face of a low bank reserve no uneasiness was occasioned. A depletion of money might be reasonably welcomed, rather than an accumulation that stimulates reckless speculation. Favorable conditions are reported from various sections of the country, particularly as to crop prospects. According to the Bureau reports the condition of wheat presents not merely the best May average for seven years, but surpasses the May condition in 1884, when the yield was the largest ever reported. For Dakota and Minnesota alone, we are told, the recent rains would be "cheap at \$1,000,000." The season in Texas is said to be at least one month in advance of previous years, and the outlook for crops was never more promising. It is also stated that the assurance of more stability in railroad tariffs, resulting from

the salutary operation of the Interstate Commerce law, is heightened in effect by better railroad earnings. Among other influences are the decrease in iron production, a reduction of 10 cents in tolls on bituminous coal and 20 cents on iron ore from Lake ports and the opening of a new line from New York to Chicago. Corn is more active. Wheat is firmly held, spot cotton is steady, provisions are dull and weak under large receipts. Prices of staple dry goods rule firm all around, and in the case of print cloths are raised 1.16¢.

On the Stock Exchange the volume of business is small, and there is little activity beyond a few leading specialties. Atchison, St. Paul and Oregon Transcontinental have been most conspicuous. The contest for the control of Oregon excited much interest. Richmond Terminal was strong in face of the proposed issue of stock. On Tuesday the tendency of prices seemed to be downward. Atchison continued to reflect a growing confidence. appointment of a receiver for the St. Louis, Arkansas and Texas had little effect. The undertone was strong until the final dealings, when the whole list fell off and the market was heavy.

United States bonds were quoted as follows:

U. S. 4½, 1891, registered.....	106½
U. S. 4½, 1891, coupon.....	107½
U. S. 4, 1897, registered.....	124½
U. S. 4, 1897, coupon.....	125½
U. S. currency 6s.....	121½

The total bond purchases from August 8, 1887, to date have been \$167,459,900, of which \$61,587,250 were 4 per cents and \$103,862,650 were 4½ per cents. Their cost was \$193,574,784, of which \$78,925,014 was paid for the 4 per cents and \$114,649,770 was paid for the 4½ per cents. They would have cost at maturity \$229,124,951.

The total bank clearances last week in 40 cities show an increase of 13.3% over the corresponding period last year. Outside of New York the clearances are increased 11.6%.

The weekly statement of the associated banks shows a loss of \$672,000 in surplus reserve, which was unexpectedly favorable, considering the recent heavy specie shipments. The surplus reserve now held amounts to \$8,821,135. Against a loss of \$3,204,900 in specie there was a gain of \$2,675,100 in legal tenders, resulting from the influx of currency from the interior. In loans there was a contraction of \$905,500. The money market has ruled fairly easy during the week, but for time loans there was a firmer feeling, and there was little disposition on the part of lenders to make engagements maturing after September except at an advance. The demand for commercial paper is urgent in the absence of opportunities for profitable investment. Quotations for indorsed bills are 3½% @ 4% 60 @ 90 days, and first-class commission-house names are 4% @ 4½% four months. The counting of \$178,394,763.45 in cash in the vaults of the Sub-Treasury was completed and the amount found to be correct. H. B. Collins & Co., the bankers, of this city, control the entire capital stock of the two gas companies doing business in St. Louis. It is said that the purchase amounted to \$8,500,000. The Spanish-American Commercial Union have leased permanent quarters in the Manhattan Bank Building, in Wall street. Exports of specie for the week were \$808,000 and of merchandise \$6,919,000, the latter including 230,500 bushels of wheat, 545,000 bushels of corn and 28,427 bales of cotton. Importations amounted to \$10,207,000.

The market for sterling was steady, with no features of interest. Bankers were divided in opinion as to whether any important shipments of gold to Europe are likely to be made this week. Posted rates



closed at 4.88 for 60 days and 4.89½ for demand. On the Paris Bourse last week Credit Foncier shares fell 10 francs; Rio Tintos declined 11 francs; Comptoir d'Escompte shares lost 12 francs. The Rothschilds arranged for a Russian conversion loan for \$240,000,000.

The imports at New York during April amounted to \$40,599,237, a gain of \$1,200,000 on the corresponding month last year, but the demand for foreign products was not sufficient to impart much animation to the market. In a survey of the previous 18 years it appears that there were five corresponding months when the receipts of foreign merchandise were larger. For four months the imports make a total of \$168,550,700, as compared with \$161,805,700 in the same time last year, and for ten months the total, including specie, is \$387,589,000, against \$385,066,000 for ten months ending April 30, 1888. The total exports for ten months of the fiscal year are \$318,045,000, an increase of about \$31,000,000 compared with the previous year, figures which are encouraging but look meager compared with 1881, when shipments of produce and merchandise alone were \$75,000,000 in excess of the current year.

The Bureau of Statistics reports total exports of breadstuffs during April to have been \$9,537,376, an increase of about \$1,500,000 over those for April, 1888. Of these the exports of corn were \$3,750,291, an increase of nearly \$3,000,000; of wheat \$2,534,032, a decrease of about \$100,000, and of wheat flour \$3,135,547, a decrease of \$1,300,000. For the ten months of the fiscal year the exports of breadstuffs were \$101,282,823, as compared with \$110,028,536 for the corresponding ten months of 1888. The exports of cotton for April were \$15,880,910, about \$2,500,000 more than for April, 1888. The exports of mineral oils were \$3,641,490, about \$400,000 more than April, 1888. The total exports of beef and hog products for April amounted in value to \$8,388,602—an increase of about \$1,500,000 over April, 1888. The total exports of dairy products were valued at \$420,021—an increase of about \$100,000.

## Coal Market.

The outlook for Anthracite Coal is not as cheering as the trade might desire, on account of the plethora of stock as compared with demands, and this despite the persistent efforts to keep production within the prescribed limits. Still, there is claimed to be some improvement. Intimations are thrown out that at the next meeting of sales agents in this city, 22d inst., "an advance" in tidewater prices will be announced, but it is elsewhere assumed that this does not necessarily follow; that really the design is simply to stiffen the schedule. The Eastern demand is satisfactory, while in the Western trade stagnation is the feature.

The Pig-Iron manufacturers have addressed a letter to the most prominent furnacemen to secure a reduction of the freight rate on Coke. The Philadelphia Press of Wednesday says: "The price of Coke is now \$1 ½ ton, while the freight to the Eastern furnaces is about \$2.25 ½ ton. The price of Anthracite Coal is just double the price of freight. This the furnacemen say is not just and that a considerable reduction should be made in the freight on Coke. It was reported that the Southern furnaces could manufacture Iron for \$10.50 per ton, and paying full freight they could ship it North and sell it for \$14.50, thus making from \$1 to \$1.50 on every ton. To compete with them something must be done and done quickly, and the first thing is the reduction in Coke. At the Reading's office it was said that a number of furnacemen had been to see them, and they had

proffered them their support. If the other companies would act they would willingly make a concession." The Philadelphia Ledger says: "Several of the larger mining and carrying corporations, as well as a number of individual operators, are reported to have sold their output of Coal for the entire month of May at about the actual selling quotations which were ruling in the later part of April, and consequently they are now asking higher prices." The scarcity of vessels and consequent advanced rates of freight operate to retard shipments. The output of Coal reported for the week ending May 11 is 584,427 tons, an increase of about 96,000 tons compared with the previous week. Since January 1, the total is 10,062,000 tons, a decrease of about 1,602,000 tons compared with the same time in 1888.

The following from a Philadelphia paper excited much comment in the trade: "The Reading Railroad Company have their surveyors out locating a line from Loftus to run into the heart of the Lehigh Valley Coal region. Ever since the Lehigh Valley Railroad Company built an extension to Pottsville the Reading Company have been trying to get even with them, and by building this new road they expect to get control of a great deal of their rival's Coal tonnage. A large number of the Coal mines in the Lehigh Valley are owned by the Lehigh Valley Railroad Company and operated by them. They also have leased out a number of mines to individual operators, but with the promise that they ship all the Coal mined over the Lehigh Valley Railroad. Besides these mines owned and controlled by the Lehigh Valley there are a number of operators who can ship their Coal as they please, and it is said that these operators have been soliciting the Reading people to make the extension. Among the principal operators who want to ship their Coal over the new road are: Coxo Bros. & Co., the Pardees, J. S. Wentz & Co., W. T. Carter & Co., the Silver Brook Coal Company, Linderman, Sker & Co., and M. M. S. Kemmerer."

A. Pardee & Co.'s breaker at Hazleton was destroyed by fire 9th inst. The fire originated in the boiler-room. Loss, \$50,000. Rebuilding will commence at once.

Bituminous Coal is plenty and inferior grades are cheap. The output of Cumberland for the week was 57,071 tons; Clearfield, 67,560 tons; Beech Creek and Pocahontas each nearly 38,000 tons.

The Philadelphia and Reading and the Pennsylvania railroads have reduced the rates on Bituminous Coal from the Beech Creek and Clearfield regions to \$1.70 for tidewater shipment. The Baltimore and Ohio reduced their rate on Cumberland Coal to \$2 per ton.

## Metal Market.

**Copper.**—Conferences among the representatives of the Copper mining companies were held in this city during the past few days, with the object of arriving at some arrangement. On the 16th the two months expire during which deliveries to the syndicate were to be stopped, the agreement in question ostensibly making it impossible to fix a price. It is generally understood, however, that the mines have been supplying customers, with the understanding that a rebate would be given to them equal to the difference between 16½¢ and the price ultimately to be fixed on all Copper delivered during the interval. It is probable that the mining companies will make an effort to place the price as high as they dare go, even at some risk, in order to make the rebates on former business as small as possible. They argue that after all the manufacturer has little cause for growling, since it is altogether unlikely that he has given his customers the ben-

efit of it or will do so now. The meeting on Tuesday appears to have been devoted exclusively to the discussion of the European situation. All the representatives are pledged to secrecy, but it is understood that the proposition before the meeting was the following: The bankers holding syndicate Copper in this country are to transfer the whole of the stock to the other side and agree to maintain the market at £45, G. M. B., distributing the disposal of their holdings over five years. In consideration thereof the American miners agree not to export as much Copper by 20 % as they did in 1888, when the shipments aggregated about 75,000,000 lb. In other words, a policy of mutual non-interference is to be adopted. It should be stated, however, that thus far this plan has not been adopted so far as known, nor do the utterances of Mr. Haggin on his arrival give much hope of it. To-day the American companies held a second meeting, at which the home situation was discussed. Obviously any success in maintaining a fixed price must be contingent upon an arrangement with foreign holders. It has been urged that 18¢ be made the price, but the general opinion seems to be that 12¢ will be the figure. In fact, Lake for June delivery has been offered to manufacturers at 12 cents. It is possible that some compromise measure, paying a rebate of 3½ cents for the copper delivered during the last two months, will be arranged. The manufacturers will certainly be slow to contract for any length of time for any quantities at any price fixed upon by agreement. They have not got any faith in the whole undertaking and will act accordingly. For May and possibly June they must and will buy literally, but they will let other people carry stock and will keep the quantity of metal in their mills down to the lowest notch. As a speculation 12¢ copper is certainly not a tempting commodity. Casting brands have meanwhile been sold at 11½¢ @ to 11¼¢. London gave way from £39.15/ to £39 yesterday since our last report, with but little doing.

**Tin.**—London has been quite active and a little higher; opening at £91, spot, a week ago, it closed yesterday at £91. 2/6, while futures improved from £91.15/ to £92; sales 1000 tons, all told. In this market 10 tons May were at first placed at 20.60¢, subsequently 80 tons at 20¢ @ 20.25¢, and 80 at 20.70¢ @ 20.75¢; 40 June at 20.40¢ @ 20.60¢, and 25 tons August at 20.65¢, in accordance with the momentary London fluctuations, which somewhat unsettled the market. Messrs. Gilfillan, Wood & Co., Singapore, in their report of April 9, remark: "The supply during the next six weeks will be on a reduced scale, and it is estimated that the year's production will not be over the average." The closing quotation for Tin on the spot is 20½¢ @ 21¢. **Tin-Plates.**—Have been quiet and unaltered, both here and in Liverpool. During the first quarter the total shipments from England were 110,017 tons, against 87,591 in 1888 and 77,559 in 1887; the export this way was respectively 87,286, against 68,347 and 58,058. We quote, large lines, ordinary brands, ½ box: Siemens-Martin Steel, Charcoal finish, \$4.80 @ \$5.50; Coke finish, \$4.60 @ \$4.70; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.25 @ \$4.35, and Wasters \$4.12½ @ \$4.15.

**Lead.**—While the Treasury has the Mexican Ore question under consideration, no further sales of Common Domestic to consumers have transpired in this market to speak of, the quotation at the close being 3.80¢ @ 3.90¢, nominally.

**Spelter.**—A much better feeling and more doing locally can be reported, hence

we have now to quote Common Domestic 4.80¢ @ 4.85¢, below which figure nothing can be had, while with the rise in Europe Silesian cannot be sold for less than 5½¢.

**Antimony.**—While the demand has remained moderate, prices have gone on stiffening in response to the higher London ruling, so that we can now quote Hallett's 12½¢ @ 12½¢, and Cookson's 13½¢ @ 13½¢.

The annual report of the Rio Tinto Mining Company has just reached us. The company have a share capital of £3,250,000, £2,182,140 first mortgage 5% bonds and £1,127,180 second mortgage 5% bonds. The gross earnings, including balance of £27,269, were £1,142,778. The net earnings were £754,706. An interim dividend of £325,000 was paid during the year, and a further dividend of £227,500 is recommended, making £552,500, or 17% on the par value of the stock, carrying to revenue account a balance of £202,206. The total quantity of Ore mined was 1,403,638 tons, against 1,182,438 tons in 1887, the average Copper contents being respectively 3.049% and 2.949%. The product at the mines was 18,522 tons of 21 cwt. in 1888, against 17,813 tons in 1887. The quantity brought to market was 17,945 tons, in addition to 7830 tons contained in the Pyrites delivered, making a total of 25,325 tons. The report adds: "The Copper stocks, chiefly in Matte and Precipitate, at Huelva and Cwm Avon carried over at cost price amount to 4600 tons." These figures are interesting, in view of the statement made that the Rio Tinto had delivered more than they were entitled to and had pushed production to the utmost by smelting a good deal of Ore in Spain in blast-furnaces.

#### New York Metal Exchange.

The following sales are reported:

THURSDAY, May 9.	
10 tons Tin, May.....	20.25¢
16 tons Lead, June.....	3.92½¢
100 tons Lead, June.....	3.90¢
10 tons Tin, June.....	20.40¢
20 tons Tin, June.....	20.50¢
10 tons Tin, June.....	20.60¢
FRIDAY, May 10.	
20 tons Tin, May.....	20.70¢
10 tons Tin, May.....	20.75¢
16 tons Lead, September.....	3.95¢
25 tons Tin, August.....	20.65¢
TUESDAY, May 14.	
10 tons Tin, May.....	20.60¢
28,000 lb G. M. Copper, May.....	11.05¢
28,000 lb G. M. Copper, May.....	11.00¢
WEDNESDAY, May 15.	
10 tons Tin, spot.....	20.70¢

### British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, May 15, 1889.

Prices for Chili Bars and Good Merchant Copper advanced on the strength of demand to cover "short" warrants, and reacted on subsequent free selling by agents of the leading mines. Sellers still ask comparatively high prices, which are paid, for special sorts. The Anaconda company has sold 1500 tons Matte at 8/. It is understood that a promise has been obtained from some of the mining companies to reduce their output and allow warrant-holders to share in supplying the trade demand. There is no truth, however, in the statement that holders and producers have entered into an agreement to regulate prices. Negotiations to that end have been dropped since the American delegates sailed.

In a report by the president of the French bank the statement was made that the institution had advanced at the rate of £48 per ton on 1225 tons of Copper. The Mason & Barry Company announce a dividend of 9/ per share, and the report of the company shows that £42,000, the amount owing by the Société des Métaux on two shipments, has been carried forward. The Rio Tinto Company announces a dividend of 14/.

The Block-Tin market has been supported the last few days by purchases for America, and it is stated that there are still a number of orders here unexecuted. Otherwise speculation has been slow, but more purchasing has stiffened prices to £92. 15/ for prompts.

Buyers of Tin-Plate are still waiting for easier prices. The market is overloaded with ordinary grade Coke, but Bessemer and Siemens Cokes are active at an average of 13/9, and, being well booked ahead, makers are very firm. There are now over 375,000 boxes of Plates, all kinds, at shipping ports, or 135,000 boxes more than was on hand at the corresponding period last year.

The strikes in Germany have had some influence upon the Pig-Iron market, it being thought that, should the troubles continue, stock will be taken from Connal's stores to meet the shortage of supplies. This has led to more speculative buying and higher prices for warrants. Very little change has taken place in prices for makers' brands of Scotch, in Hematites or in Cleveland Pig.

In nearly all branches of the Manufactured Iron and Steel trades business continues brisk and prices are strong. Staffordshire Steel-makers have thus far advanced their prices 12/6, bringing the figures for heavy sections up to within 5/ of the price proposed to be fixed by the promoters of the syndicate.

**Scotch Pig.**—There has been a very fair business with but little change in prices:

No. 1 Coltness, f.o.b. Glasgow.....	55/6
No. 1 Summerlee, " ".....	54/3
No. 1 Gartsherrie, " ".....	52/6
No. 1 Langloan, " ".....	54/
No. 1 Carnbroe, " ".....	47/3
No. 1 Shotts, " at Leith.....	58/8
No. 1 Glengarnock, " Ardrossan.....	51/6
No. 1 Dalmellington, " ".....	48/
No. 1 Eglinton, " ".....	44/

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

**Cleveland Pig.**—The market without important change; business fair. No. 3 Middlesborough, G.M.B., quoted 39/ prompt.

**Bessemer Pig.**—A quite active business doing and the market strong. West Coast brands, mixed numbers, 49/ @ 49/6, f.o.b. shipping point.

**Spiegeleisen.**—There continues to be a brisk demand and prices are strong. English 20% quoted 82/6, f.o.b. at N. W. England shipping point.

**Steel Rails.**—The decline of last week has been recovered and demand is brisk. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—A good demand for these, and prices firm. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—There is still a good trade at firm prices. Bessemer, 2½ x 2½ inch, £4. 10/, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Transactions moderate, but prices held firmly. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—But little doing in these and former prices asked. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6, c.i.f., New York.

**Scrap-Iron.**—A moderate business at about former prices. Heavy Wrought-quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—The demand moderate and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin-Plate.**—Trade rather slow and prices barely steady. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade.....	15/3 @ 15/6
IC Bessemer Steel, Coke finish.....	13/8 @ 13/9
IC Siemens.....	14/ @ 14/3
IC Coke, B. V. grade.....	13/ @ 13/3
Charcoal Terne, Dean grade.....	12/ @ 12/6

**Manufactured Iron.**—The market less active than last week, but still a good business doing at steady prices. We quote, f.o.b. Liverpool:

	£	s.	d.	£	s.	d.
Staff. Marked Bars.....	8	5	0			
Common.....	6	0	0			
Staff. Bk Sheet, singles.....	7	15	0			
Welsh Bars (f.o.b. Wales).....	5	5	0	5	7	8

**Copper.**—A fairly active movement. Prices somewhat irregular. To-day's prices for Bars were £38. 15/ @ £39, spot; £38. 15/ @ £38. 17/6, three months' futures. Best selected, £44.

**Tin.**—Business quite brisk and the market firm. Straits quoted at £92. 12/6 @ £92. 17/6, spot, and £93. 5/ @ £93. 10/ for three months' futures.

**Lead.**—Trading smaller, but prices very steady. Quoted £12. 12/6 for Soft Spanish.

**Spelter.**—Dealings continue lively and prices are stronger. Quoted at £17. 15/ @ £17. 17/6 for ordinary Silesian.

### Foreign Markets.

#### EAST INDIES.

PENANG, April 2, 1889. — **Tin.**—Receipts sum up 7400 piculs for the fortnight. Europeans bought 5000 piculs and Chinese 5600. The market gave way from \$35.80 per picul to \$35.65, but winds up at \$36.41, \$36.75 having been paid by Chinamen yesterday.—Schmidt, Kustermann & Co.

#### SPAIN.

BILBAO, April 27, 1889. — **Iron Ore.**—Sales for the week have been restricted to a few cargoes Rubio at 7/ @ 7/2. Campanil, always in short supply, may be quoted nominally 8/4 @ 8/8. There being plenty of steamers, shipments have been quite lively. Since January 1 they amounted to 1,310,958 tons, against 1,260,645 in 1888. **Pig-Iron** has been in active request for domestic use, 1146 tons being shipped coastwise and nothing abroad. Spain's metal exportation during the first two months has been as follows:

	1887.	1888.	1889.
Tons.	Tons.	Tons.	Tons.
Calamine.....	3,160	2,576	2,313
Pyrites.....	128,200	113,569	180,156
Iron Ore.....	845,009	802,869	816,528
Pig-Iron.....	19,606	5,128	10,433
Precipitate.....	4,914	3,344	3,811
Quicksilver.....	228	115	750
Pig-Lead.....	24,368	23,261	22,648

Totals.....1,025,385 950,663 1,086,648  
The increase in Quicksilver exportation will be noticed.—*Bilbao Marítimo y Comercial.*

#### BELGIUM.

BRUSSELS, May 4, 1889. — **Iron.**—The Belgian Iron market remains firm. The demand for Beams has fallen off, but this is hardly perceptible, makers being busy on old orders; ere these are about delivered a revival is likely. **Pig-Iron** remains stiff; Luxembourg No. 5 Foundry sells with ease at 5.10 @ 5.20 francs per 100 kg., Charleroi at 6.50, and Steel Rails may be quoted at 6.75. The stock of **Pig-Iron** is on the increase; the export demand is slack. Sheets and Plates are scarce, and orders are declined by makers. The structural iron works are very busy.—*Moniteur des Intérêts Matériels.*

## Hardware.

Business in several lines shows an increased activity, and on the whole the volume is fair. While there is more or less complaint in regard to the season's trade, it appears that the amount of goods sold compares well with that of the corresponding time last year; but the profits for manufacturers are less, and jobbers in many cases complain of narrow margins on account of the vigor of existing competition. Prices are without important change, but are not characterized by much strength. Collections are rather slow.

### Wire Nails.

The market is without important change, the leading mills being pretty well occupied with orders. Prices are low, and to some extent irregular. A moderate business is doing from store on the basis of \$2.55 to \$2.65.

### Barb Wire.

The market is in a good condition, and while prices remain without change, they are characterized by a good tone. An excellent business is being done by the Eastern manufacturers, who find some difficulty in obtaining Wire as promptly as needed for their orders. Quotations are on the basis of 3.5 cents for carload lots, 3.6 for 3-ton lots and 3.8 cents for small lots, with the usual deliveries.

The Kelly Barb Wire Company and the Western Fence Company have removed their offices to their works at Deering, in the suburbs of Chicago.

### Cut Nails.

The volume of business done in the New York Nail market continues quite satisfactory, but prices are still low, our quotations remaining \$1.80 @ \$1.85 for carload lots on dock.

It is quite generally conceded that the much discussed pool of Eastern manufacturers over which so much time and labor have been spent is dead. It is stated that the refusal of three of the Upper Susquehanna mills to sign killed it.

The regular monthly meeting of the Western Cut Nail Association was held at Wheeling, W. Va., on Wednesday, the 8th inst. The following firms were represented:

LA BELLE IRON WORKS, Wheeling, W. Va.  
RIVERSIDE IRON WORKS, Wheeling, W. Va.  
JUNCTION IRON COMPANY, Mingo Junction, Ohio.  
WHEELING IRON AND NAIL COMPANY, Wheeling, W. Va.  
LAUGHLIN NAIL COMPANY, Wheeling, W. Va.  
BENWOOD IRON WORKS, Wheeling, W. Va.  
BELMONT NAIL COMPANY, Wheeling, W. Va.  
SPAULDING IRON COMPANY, Brilliant, Ohio.  
JEFFERSON IRON WORKS, Steubenville, Ohio.  
BELLAIRE NAIL WORKS, Bellaire, Ohio.  
KING, GILBERT & WARNER, Columbus, Ohio.

Nothing but routine business was transacted. Reports from the members showed that there has been no improvement either in the demand or prices for Cut Nails, and future prospects are not encouraging. It was thought that the recent cut made in nailers' wages by the Bellaire Nail Works would be brought up for discussion, but it was not. No date was set for the next meeting.

### Miscellaneous Prices.

In the paragraph in our last issue relating to the prices of Thomas Laughlin & Son, Portland, Me., a misleading error occurred by which, through the substitution of *and* for *for*, Tackle Blocks, as well as Iron Sheaves, were quoted at discount 70 per cent. The correct statement would have

been that Iron Sheaves *for* Tackle Blocks are quoted from the manufacturers' standard list at the discounts named—that is, Common at 70 per cent., and Patent at 60 per cent. The trade will please note the correction, as Tackle Blocks are not selling at any such price, and in fact are quite firm and in good shape.

The American Brass Kettle Manufacturers, for whom O. W. Graves is agent, 21 Cliff street, New York, are putting on the market this season a line of Brass Kettles *tinned inside*. This is done to meet the demand for such goods, in the use of which there will be no danger of the food being contaminated by its contact with the brass, thus adapting them to more general use and commending them in an especial degree. The Brass Kettles thus tinned inside are made in sizes from 8 to 17 inches, and are sold at an advance of 2½ cents per pound over the regular goods, the prices for the season being 24 cents for the regular goods and 26½ cents for the inside tinned. It is expected that there will be a large demand for these new goods.

The prices of Picks, Mattocks, &c., under the recent arrangement made between the manufacturers are steady and firm, and a satisfactory trade is being done.

There is more or less complaint of irregularity in the prices of Carriage Bolts, and there is some evidence that in one way or another the combination terms are departed from, but in general the arrangement is working pretty satisfactorily, and it is hoped that these irregularities will be corrected.

The Chain market is without material alteration, but it is noticeable that there is a slight tendency toward lower prices. More or less irregularity exists in the prices named by different manufacturers, and some of the leading makers have recently made offers at concessions from prices heretofore prevailing. Existing quotations are recognized as low and some of the manufacturers who are not as completely equipped as the others have some difficulty in meeting the market.

A good business has been done the past spring in Wire Mats, but there are indications that this line of manufacture is becoming somewhat overdone, owing to the number of manufacturers who have entered the field and the extent of their facilities.

In sympathy with the Copper market lower prices are named on Copper Rivets and Burrs, and it is expected that other goods into which Copper enters as an important material will be to a greater or less extent affected by the decline in Copper. Several lines, however, did not follow Copper in its advance and will probably not be materially changed by the reduction in its price.

Some manufacturers are offering Files at lower prices than prevailed a month ago, and this line of goods as a whole is not characterized by much strength. The manufacturers who occupy the first place in regard to quality are able to obtain considerably better prices than others the reputation of whose goods is not so assured.

The Echo Pistol, made by the Hamblin & Russell Mfg. Company, Worcester, Mass., and illustrated on page 757, is put up one dozen in a box, three gross in a case, and is sold to the trade generally at \$10.50 per gross.

### Trade.

From a special correspondent we have the following advices in regard to the condition of business in Northern Illinois:

Trade through Northern Illinois is good for those who do the most business, while the smaller dealers are complaining of things being

dull. The extremely dry weather has caused a feeling of fear that the crops would seriously suffer, and parties interested in grain and cereals have watched the weather reports from day to day with as much interest as if they were infallible. While rain and local showers have been predicted, dryness has been the result. It is surprising, however, how much dry weather crops will stand when properly put in. During the past day or so, however, some slight showers have relieved the anxiety, and we trust a continuance of these will improve every one's temper. The retail trade is very busy, selling and delivering Gasoline Stoves and Refrigerators, which the extremely warm weather of the past two weeks has created a demand for. In fact, some of the merchants are complaining of overwork in this direction. Modern civilization has created a demand for this class of goods of which our relatives of 50 years ago had no conception. We wonder how, without Screen Doors and Windows, Gasoline or Oil Stoves, Refrigerators or ice, with 10 or 15 children, the grand old hard-working housewife got along at all.

From Salt Lake City, Utah, we have the following advices, which give information in regard to the condition of things in that city and Territory:

The condition of business in general is fairly good. Have recently had fine rains, which have materially improved the growing crops, and the condition of business has correspondingly bettered. Hardware is in good demand. Stocks are full and quite complete and as large as usual. Prices generally are good. The prospects for trade during the next few months are good. Considerable immigration is coming to the Territory from Eastern States. Our best mining camps are producing largely, and some new mines recently opened are turning out well. Prospects for building in this city and principal towns in the Territory are very good, and there will be more building than usual. We have a large amount of good farming lands in this Territory and good crops materially improve general business. The outlook now is rather favorable for moderately good crops. Collections are rather slow in most localities, but as the wool crop will soon be marketed they will doubtless much improve within a few weeks.

From a wholesale Hardware house in Georgia we have the following review of the business during the past 12 months:

Our year's business (1888-89) is fast nearing its close. It will find us highly satisfied with its results, and we are of the opinion that the Hardware trade throughout the State has been very satisfactory. While prices have been quite low on the majority of lines of goods, still the volume of business is very much larger and the prospects are very flattering for a continuance of fair trade even until fall business opens, which is early in July. With us, like many other sections of the South, the building season promises to be one of great activity. There is not an idle mechanic in the city, and not a house under contract but what an occupant only awaits its completion. To be sure, the prosperity of an agricultural country depends on the success of the farmers. Blessed with fairly good crops last year and already under the most favorable circumstances for planting, they have launched out again in good spirits, hoping for another good yield. Under the circumstances we had good collections.

### Hardware in Texas.

From the voluminous reports received from our subscribers in all parts of Texas we are enabled to give a general view of the condition of the Hardware business in that State, with a special reference to its course since the first of the year, and the opinion of merchants in regard to the outlook for future business. It is to be noted with gratification that the tenor of the reports received both from the large and small trade is almost uniformly cheerful, the business for the past four months having been in nearly all sections good, and in many cases exceeding in volume that of last year, and in several instances being better than any recent year. At the present time trade is, as usual at this season, comparatively quiet, business holding off until the crops are harvested. The prospects for the crops are uniformly referred to as good at the time of writing, the indications pointing to large harvests, though of course at this time it is impossible to predict with confidence in regard to the outcome. At the present time there is some complaint in regard to collections,

but they have been fairly good during the past season, and are referred to by several of our correspondents as having been exceptionally satisfactory. On the whole the prospects for trade throughout the State are excellent, and the year promises to be, as it has begun, eminently satisfactory. In regard to the central portion of the State we have from one of our correspondents the following advice, which agree with others which we have received:

During the past winter Central Texas (the black, waxy land section) had long-continued rains which thoroughly saturated the earth, started all the springs and filled all the streams, and these rains we count as the foundation for a good crop in every line the coming season, as good full crops can now be made with comparatively light rains during the summer. The acreage in oats and wheat is fully up to the average. The grain now looks well and is beginning to stalk. The corn is all up with a good stand in most localities and full acreage. The cotton acreage will be increased 5 to 10 per cent. Much of the seed is already planted and the ground is in good condition to receive the balance. All considered, our prospects are first-class.

Throughout the State there is good activity in building, and railroad construction in some sections is stimulating business, but in order to give our readers more detailed information of the condition of things in the different parts of the State we make the following abstracts from reports received from some of the principal points:

**AUSTIN.**—Business is considered fair in general, and about 20 per cent. better than during first four months of last year. The condition of Hardware is somewhat better than other branches of mercantile business. Stocks of Hardware are about as usual. Prices are generally lower than heretofore, which, however, is not attributable to any local causes, our rate of profit being pretty near the same as usual. Prospects for trade during the next few months are better than they have been for several years at same period. There will be nothing beyond the usual amount of improvements. The agricultural condition is good and promising, which inspires confidence and stimulates trade. Collections are better than for several years at this time of the year. Impressions received from traveling salesmen as to business are very good, promising a good trade for next fall contingent upon realization of present agricultural prospects. Reflex of Oklahoma excitement, harbor improvements at mouth of Brazos, development of iron industries in East Texas, &c., will probably cause more rapid development and improvement in our State.

**DALLAS.**—Trade for the next few months will be light in the interior, but stocks of Hardware are not too large for the requirements of the trade. During the season business has been good, but is now quiet. In this city there will be a good deal of building. The agricultural conditions are promising, but trade will be light until the fall, when if crops are satisfactory an excellent business will be done. An increase in immigration is noted, promising well for future business.

**HOUSTON.**—The outlook was never better at this time of the year in our section of the country. We believe that our Hardware merchants are doing a very fair business and are in a thrifty condition. Our merchants are well stocked, as largely as at any time for this season of the year. Prices are well maintained in all lines. We have prospects of a splendid business year. Prospects for building are good. Agricultural conditions are very promising in all sections of our State. Collections are good for this time of year. Traveling salesmen report good business. The prospects are good, and we feel confident of splendid developments in the Southwest.

**SAN ANTONIO.**—General business is very good, as is also Hardware, but it is expected that there will be an improvement in May. Stocks are large in this city and prices have a downward tendency. The prospects for building are excellent, about 80 buildings being in construction, and it is expected that others will be started soon. The prospect for crops is good, and altogether the outlook for business is promising.

**WACO.**—Hardware is more overdone than other lines and the conditions may be regarded as less favorable in Hardware than in general business. I am under the opinion, which is based on my own observation and the testimony of intelligent traveling men, that Waco has better stocks of Hardware than any other city in the United States not more populous and that has no more territory tributary to it. The

general tone of the market is still weak, suffering from congestion caused by chronic overproduction. I look for a turn of the tide before the year is out. The well-known dull period usual at this time of the year in most cotton-growing countries is very apt to be with us at least until August, and longer if the crop prospects should be unfavorable then. The prospects for building are not good, as we have more storehouses now than are likely to be needed in two years, and plenty of dwelling-houses for present wants, and farmers are mostly financially unable to attempt any improvement this summer. Prospects for a good crop were never better at this time of the year than they are now, but a prudent buyer never buys on crop prospects in Texas, for "there is many a slip 'twixt the cup and the lip." Considering past crop failures collections are reasonably good at present. A dull trade is expected until the crops are assured and a brisk trade afterward. The railroads are discriminating strongly in favor of the water points and against the interior cities. If this discrimination is continued for five years almost the entire jobbing business will be driven away from the interior of Texas to the shores of the Gulf and the banks of the Mississippi River.

**WEATHERSFORD.**—Business is brisk in farming implements, but Builders' Hardware rather quiet. Building is fair, more or less going on all the while. The agricultural conditions very encouraging and wheat and oats look well, with a fair acreage. Large crops of cotton and corn planted. Stock interest is rather flat. A fair prospect for trade.

#### Items.

We have received from the Gilbert & Bennett Mfg. Company, 148 Lake street, Chicago, a copy of their catalogue No. 110, which has just been issued. It consists of 80 pages of illustrations and descriptive matter, covering an immense variety of Wire Goods, Wire-work, Wire Cloth, Netting, Fencing, &c. The goods shown embrace Tools, Domestic Implements, Ornamental Wire-work, and all kinds of ingenious devices into which Wire is capable of being formed. It is only by glancing through such a catalogue as this that a true conception is obtained of the important part now occupied in the industrial world by Wire. Full price-lists are printed in connection with the several articles. A complete alphabetical index is an important and very useful feature of the catalogue.

**E. Bement & Sons, Lansing, Mich.,** issue a circular relating to patents on Harrows controlled by them, and refer to J. M. Childs & Co., Utica, and A. W. Stevens & Son, Auburn, N. Y., as the only concerns authorized to manufacture under their patents.

A recent issue of *Health* has an article entitled "A Good Filter," in which a description is given of the Filter manufactured by the Gate City Stone Filter Company, 46 Murray street, New York. It also emphasizes the importance of filtering water in order to remove impurities.

**W. R. Baker Mfg. Company, Watertown, N. Y.,** have issued a neat catalogue of nearly 100 pages, showing the line of Hardware specialties which they manufacture, together with a general line of Trimmings and Hardware for canoes, pleasure boats and yachts, inside and outside Brass Fixtures for banks, offices and residences. It will be remembered that this company succeed W. R. Baker & Son, and in the circular to the trade it is stated that the change gives them considerable additional capital, and enables them to enlarge their plant and increase their manufacturing facilities. Additions to their present three-story building are in course of construction. It is intimated that in addition to their regular line of Boating Hardware, their factory will be equipped for the manufacture of Hardware specialties of every description, and that they will add various other goods.

**Brewer Bros., Philadelphia, Pa.,** have issued a new catalogue which is exceptionally complete in its representation of Wrought Goods, of which a large variety

is shown with illustrations and list prices. In addition to the more common line of Hooks, Staples, Meat, Awning and other Hooks, a variety of Mirror Hooks, Stay Nails, Hitching Hooks and Rings, to drive, screw or lead in, Sign Hooks, Nail Drags, Corner Braces, Mending Plates, and many other goods are shown. The catalogue is neatly printed, and will be found very convenient.

The motion made recently in the United States Circuit Court in behalf of the Enterprise Mfg. Company for a preliminary injunction to restrain Peter Deissler from manufacturing and John Wanamaker from selling a meat-cutting machine, alleged to be an infringement of the plaintiff's rights under a patent, was disposed of by Judge Butler, May 10. The writ was refused for the present, the court giving the defendants the option to either enter security and render an accounting of profits from the present time until the matter came to final hearing or have the preliminary injunction granted. An order was directed to be entered in accordance with this decision.

**Sidney Shepard & Co., Buffalo, N. Y.,** have issued a new catalogue of nearly 200 pages, which represents the line of goods manufactured and for sale by them. A full-page illustration is given of their handsome store and views also of their works. The extent and variety of the manufactures of the house is indicated in the fact that 183 pages are devoted to their representation, including a large assortment of Tin-Ware with many interesting specialties, and such other goods as Dripping and Fry Pans, Bath-Tubs, Kettle Spouts, Handles, Ears, &c., Dampers, Damper-Clips, Stove-Boards, Japanned Ware, Mincing-Knives, &c. An interesting variety of house-furnishing goods, including Refrigerators, Bird-Cages, Wringers, Stove-Polish, &c., are shown, and a line of Tinmen's Tools and Machines. The extent of their line of Tinner's Supplies is to be especially noted. Many of the specialties shown in this catalogue are also widely known, and among them may be mentioned Bread-Raising Pans, Gem or Muffin Pans, Buffalo Drinking-Cups, Oblong Dinner-Pails, Buffalo Family Oil-Cans, Sieves, Egg-Beaters, Milk-Cans and Fixtures, the Shaker Flour-Sifters, and Grocers', Druggists' and Spice Dealers' Tin-Ware. Owing to the weight of the catalogues they will not be sent by mail, but it is stated that they will take pleasure in packing a copy of the same with the first order received from their customers. The list is accompanied by a revised list of prices of Pieced Tin-Ware, in which a general reduction is noted.

Announcement is made by **Aquila Rich, 84 William street, New York,** that having withdrawn from the firm of C. T. Reynolds & Co., with whom he has been identified for the past 30 years, he has formed the Aquila Rich Paint and Color Company for the purpose of continuing the manufacture, importation and sale of Dry Colors, Paints in Oil and Japan, Varnishes and Artists' Materials.

The **Chapman Mfg. Company, Meriden, Conn.,** in addition to their old lines, Saddlery Hardware and Sleigh Bells, have recently begun the manufacture of Dog-Collars, of which they have a number of new styles. They state that in connection with the other branches of their business they are enabled to produce Dog-Collars at exceptionally low cost. An addition to their factory is in process of erection, designed especially to accommodate the Dog-Collar department.

**Albert Geiger, 6 Oliver street, Boston, Mass.,** calls attention to a valuable business property in his advertisement on page 49. It includes the machinery and tools, with buildings, lands and leasehold, formerly



occupied by Welch & Griffith. The property is situated on Grove street, in Arlington, Mass., and is referred to as well adapted for manufacturing purposes, having both steam and water power.

The Canton Saw Company, Canton, Ohio, issue neat colored lithographs calling attention to Class' See-Saw and Merry-Go-Round, which they are manufacturing. It is made in two sizes, one intended for the lawn and the other for the parlor or nursery.

A recent number of the *Evening News*, Detroit, Mich., contains a portrait of L. W. Sprague, senior member of the firm of Sprague Bros., well-known Hardware merchants, Greenville, Mich., and gives a sketch of his life, with reference to some of the qualities which have given him the prominent position he occupies.

Farwell, Ozmun, Kirk & Co., St. Paul, Minn., have issued a Hardware catalogue which will rank with the largest and most complete. It consists of 1120 large pages, which are well occupied in the display of a very extensive line of Hardware and related goods. The extent of the assortment is indicated by the fact that the first department of the catalogue is devoted to Mechanics', Lumbering and Tanners' Tools, in the display of which 280 pages are occupied. Builders' Hardware follows, covering Locks, Padlocks, Butts, Hinges, Bolts, Door-Bells, &c., Drawer-Pulls, Coat and Hat Hooks, Screws, Wire Nails, &c., in the display of which 342 pages are employed. The next section covers Miscellaneous Hardware, including such goods as Bolts, Rivets, Tacks, Horse Nails, Saddlery and Wagon Hardware, Whips, Chains, Brushes, Shovels, Steel Goods, Lawn Mowers, Scales, Bells and many others, this section ending with page 758. The remainder of the catalogue is devoted to the following departments: Sporting Goods, Fishing Tackle, Pocket and Table Cutlery, Carvers, Plated-Ware, &c., Granite Iron-Ware, Tin-Ware and House-Furnishing Goods, Indurated Fiber-Ware, Wooden-Ware, &c., Tanners' Trimmings. It will thus be seen that the arrangement is systematic and convenient. The index is also exceptionally complete, every compound word being indexed by both letters, making it easy to find an article under either heading. The manner in which the different goods are arranged with a view to economy of space, effectiveness of display and convenience of reference, as well as the arrangement of the catalogue as a whole, reflects credit on A. E. Allen, by whom the volume has been compiled, while the extent of the book and the large and varied line represented in it indicate the enterprise of the company and the important position occupied by them in the trade. The printing, electrotyping and binding, all of which are very satisfactory, were done by the Pioneer Press Company, of St. Paul, and a large part of the wood engraving by the Art Engraving Company, of that city.

The Allendale Lock Company, Lancaster, Pa., have issued an illustrated and descriptive catalogue, showing their recent improvements in Scandinavian Padlocks, and giving a full description of their new Padlock with patent tumbler, of which we recently gave a description. A line of Malleable-Iron Padlocks is also shown. The company have discontinued the manufacture of the old-style Red Lock, and state that they will hereafter manufacture only goods of the first quality.

D. G. Gautier & Co. are occupying 114 John street, New York, as a Steel warehouse and carrying a full line of Merchant Steel. They call attention especially to their individual brand of High-Grade Tool Steel, which is controlled solely by them, and allude to their extra and special grades

as equal to any English brand of Tool Steel made. They will also carry in stock the regular sizes of Machinery Steel, Spring Steel, Toe-Calk Steel, Tire Steel and Cold-Rolled Shafting manufactured by the Gautier Steel Department of Cambria Iron Company. They also allude to their arrangements for furnishing Die-Blocks, Steel Forgings and other shapes and grades of Steel not usually carried in stock.

The suit brought by the Chas. F. Henis Company, Philadelphia, against Paine, Diehl & Co., of that city, for infringement of patents on the Henis Press and Vegetable Strainer has been decided in favor of the plaintiffs and an injunction granted.

### Merchandise Brokers in Southern California.

Southern California, with its development and its increased importance as a mercantile field, is showing a disposition to assert itself, and claims more consideration in trade matters than it has heretofore received. One grievance of which they complain is the establishment of agencies for the Pacific Coast with headquarters at San Francisco, making the point that Southern California, having so important a trade center as Los Angeles, should receive more consideration and have agencies established there. On this point a recent issue of the *Commercial Bulletin* of Los Angeles says:

It is high time that the merchandise brokers of Los Angeles arose and made vigorous protest against the establishment and maintenance of Pacific Coast agencies with headquarters in San Francisco. Before going further we wish it understood that the following remarks are intended to apply only to parties doing a brokerage business, and are not intended for wholesale grocers or jobbers, who, although "agents" for large manufacturing firms, purchase their goods. We consider that these parties are not included in the category. If Eastern manufacturers and importers could be induced to realize the fact that the Pacific Coast embraces a stretch of country equal in extent to the area from Pensacola to Maine and from New York to Chicago, and that California, Arizona, Nevada, Montana, Oregon and Washington Territory cannot be compressed into the space occupied by the New England States, they would or should at once come to the conclusion that one general agent for this enormous empire is altogether insufficient to cover the field as it should be. Before Southern California attained the prominence and population it now possesses a Pacific Coast agent in San Francisco (500 miles away) was sufficient, but now it is an altogether different proposition.

Many of these Pacific Coast agencies were abolished when investigation revealed that Southern California has become a populous, busy section, and that Arizona was developing a market for Southern California's products. Investigation also brought to light the fact that Los Angeles was a teeming distributive point of nearly 100,000 inhabitants, and that the "Pacific Coast agents" in San Francisco depended on sub-agents in Los Angeles for the sale of their goods. Having to divide their commissions with the San Francisco men, a feeling of discontent very naturally arises among local brokers, and the attention which is necessary to insure success is lacking. If Eastern parties manufacturing, wholesaling or jobbing special lines of goods wish to obtain a market in Southern California and Arizona they must establish agencies in Los Angeles, covering that field, and not depend on the half-hearted half-paid work which is being performed under existing circumstances.

### Binder Twine.

The feasibility of manufacturing Binder Twine in the prisons of Illinois has been receiving consideration, and we give below an extract from the report of the Com-

missioners of the Southern Illinois Penitentiary, which was recently submitted to the Legislature. After referring to the factories in that State and the manner in which their information was obtained, the commissioners say:

We find that the present market price of Sisal Grass is about 11 cents; Manilla, from 13 to 14 cents per pound. These are combined in about equal parts in the manufacture of Binding Twine, making the cost of the raw material for this class of Twine about 12½ cents per pound. Hemp is somewhat cheaper. Whether this price is produced by the Twine Trust or by the increased demand, or both, we are unable to ascertain. The machinery for manufacturing the Twine is complicated and expensive, being covered by patents and manufactured by but one or two firms in the United States. In fact, the factory at Champaign is now putting in some improved machinery manufactured in Europe. Manufacturers offered to furnish us machinery on the cars in New York for about \$7000 for each ton of producing capacity per day. That is to say, the machinery for a factory that would turn out 10 tons of Twine per day, or 3000 tons per annum, and to give employment to 50 prisoners, would cost, delivered in Illinois, \$70,000, plus the freight. It is estimated that there was used in Illinois more than twice this amount of Twine last year. From the above it would seem that a factory containing machinery costing \$150,000, and employing 125 convicts, ought to very nearly, or quite, supply the demand for Binding Twine for Illinois. As to the feasibility of starting such a factory in one of the prisons of this State, we do not doubt it can be done. But nothing can be accomplished in time for the present season. Machinery must be manufactured to order. It is not kept in stock. Factory buildings must be erected, steam-power must be supplied, raw material must be purchased, skilled mechanics must be found and employed, convicts must be taught the use of the complicated and delicate machinery. All this takes time and money, as any other manufacturing industry does. If the prisons of our State can, consistently with our amended Constitution, be employed at any remunerative labor we do not see why this is not a valuable field toward which to direct that labor. It is true it can only give employment to a few of the many that will soon be out of employment, but, so far as it goes, it will probably conflict less with the skilled mechanics of the State than any other manufacturing industry that can be carried on by the convicts, and if it will so employ them and at the same time grant any relief to our heavily-burdened agricultural interests it is certainly worthy of a trial.

### Exports.

BY BARK SVANEN, APRIL 22, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Arkell & Douglas.—3 dozen Meat Cutters, 2200 pounds Fence Wire, 6600 pounds Fence Wire, 6600 pounds Fence Wire, ¼ dozen Churns, 3 dozen Axes, 2 cases Hardware, 2 dozen Scythes, 15 crates Washers, 8 dozen Axes, 9 cases Agricultural Implements, 102 cases Agricultural Implements, 75 reels Barb Wire, 30 cases Agricultural Implements, 26 dozen Handles, 1 case Lampware, 1 dozen Scales, 24 dozen Brooms, 1 case Hardware, ¼ dozen Saws, ¼ dozen Carriages, 4 cases Meat Cutters, 2 cases Axes, 12 dozen Washboards, 1 dozen Rolling-Pins, 10 boxes Clothes-Pins, 1 case Broom Handles, 12 dozen Pails.

FOR DELAGO BAY.

By Arkell & Douglas.—500 pounds Barb Wire, 200 pounds Staples, 120 dozen Axes, 5 kegs Nails, 230 dozen Handles, 9 cases Agricultural Implements, 1 bundle Sash Cord, 2200 pounds Sash Weights, 100 dozen Picks.

PER BARK ANNA, APRIL 22, 1889, FOR PORT NATAL, SOUTH AFRICA.

By R. W. Forbes & Son.—30 cases Scales, 4 barrels Hardware, 6 cases Perambulators, 10 boxes Clocks, 16 boxes Axes, 410 dozen Axes, 4 dozen Brushes, 1 case Toys.

By Marcial & Co.—2 dozen Steel Rakes, 14 packages Washing and Wringing Machinery.

By Corner Bros. & Co.—53 cases Tools, 19 packages Hardware, 133 cases Agricultural Implements.

BY BRIG PEERLESS, APRIL 25, 1889, FOR EAST LONDON.

By Arkell & Douglas.—75 cases Agricultural Implements, 15 cases Edge Tools, 3 crates Ranges, 3 boxes Tin-Ware, 20 cases Agricultural Implements, 3 cases Fruit Jars, 4 cases Hardware, 1 case Saws, 1 case Nails, 25 cases Agricultural Implements, 5 cases Agricultural Implements, 10 cases Axes, 2 cases Handles, 6 cases Axes, 80 cases Agricultural Implements, 9 cases Scales, 1000 Handles, 25 dozen Brooms, 4 cases Drills, 2 cases Handles, 10 cases Axes, 9 cases Hardware, 8 crates Churns, 1 case Saws, 1 case Drawing-Knives, 22 kegs Nails, 1 box Nails, 81 cases Agricultural Implements, 208 Agricultural Implements, 6000 pounds Sash Weights, 14 crates Ranges.

PER BARK HAWTHORN, APRIL 26, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Woodhouse & Stortz.—5 cases Hardware, 40 dozen Edge Tools, 8 cases Scales.

By Coombs, Crosby & Eddy.—60 dozen Brooms, 2000 pounds Nails, 47,097 pounds Wire, 12 gross Shoe Blacking, 504 Plows, 6 Corn Shellers, 1 Plow, 12 dozen Picks, 20 dozen Axes, 156 dozen Handles, 69 dozen Axes, 46 dozen Axes, 66 dozen Hardware, 5 dozen Tools, 1 set Axes, 20 Pumps, 9 Scales, 4 dozen Hardware, 4 dozen Tools, 24 Washing Machines, 25 dozen Axes, 100 pairs Plow Handles, 130 dozen Tool Handles, 4 dozen Axes, 39 Plows and Parts, 12 Children's Carriages, 28 dozen Edge Tools, 2 Scales, 6 Scales, 30 dozen Brooms, 5600 pounds Wire, 30 dozen Brooms, 9 Churns, 2 dozen Well-Wheels, 30 dozen Hammers, 6 Corn Shellers, 40 Scales, 96 Plows, 950 Plow Parts, 1 Plow, 6 Wringers, 12 Ladders, 30 dozen Axes, 36 Children's Carriages, 6 Meat Saws, 6 Children's Carriages, 50 dozen Hatchets, 8 dozen Picks, 33 dozen Brooms, 2 cases Sash Weights.

PER BARK ANTWERP, APRIL 27, 1889, FOR CAPE TOWN, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—1 Carriage, 14 cases Carriage-Ware, 8 Freezers, 4½ dozen Carpenters' Tools, ½ dozen Stuffers, 6 Churns, 500 Handles, 3 dozen Falls, 2 Tubs, 7 dozen Hardware, 3 dozen Hammers, 9 Carpenters' Tools, 2 Scroll Saws and Lathes, 30 Bird Cages, 3 dozen Traps.

By W. H. Crossman & Brother.—8 packages Hardware, 19 bundles Carriage-Ware, 18 Sewing-Machines, 21 dozen Axes, 1 case Handles, 12½ gross Axle Grease, 5 cases Carriage-Ware, 90 bundles Carriage-Ware, 20 dozen Hatchets, 3 Carriages.

By R. W. Forbes & Son.—1 case Store Trucks, 2 Refrigerators, 1 package Kitchen-Ware, 3 packages Hay-Cutters, 6 dozen Fly-Traps, 3 dozen Grain-Cradles, 5 gross Axle Grease, 4 packages Hardware.

By New Home Sewing-Machine Company.—100 Sewing-Machines.

By Coombs, Crosby & Eddy.—7½ gross Axle Grease.

By H. W. Peabody & Co.—1 case Hardware, 1035 pounds Blacking, 330 packages Harvesting Machinery.

By Arkell & Douglas.—15 cases Fruit Jars, 2 gross Blacking, 3½ gross Axle Grease, 1 gross Traps, 500 Broom Handles, 1 gross Glue.

By Strong & Trowbridge.—6 crates Blacking, 21 cases Axes, 24 cases Axle Grease, 4 cases Brooms, 2 cases Carriages, 1 case Broom Handles, 12 bundles Wash-Boards.

By Leaycraft & Co.—1150 pounds Axle Grease.

By W. B. Fox & Bro.—1660 pounds Brooms, 270 pounds Shoe Blacking, 46 pounds Hardware, 780 pounds Wood Handles.

PER BRIG CURLEW, MAY 7, 1889, FOR PORT NATAL, SOUTH AFRICA.

By W. H. Crossman & Bro.—10,500 pounds Barb Wire, 1 gross Shade Rollers, 9 Meat Choppers, 2 dozen Wood Falls, 6 Scales, 7 packages Lawn Mowers, 500 Handles, 25 dozen Falls, 3 Mangles, 50 cases Clothes-Pins, 45 Pumps, 6 dozen Hammers, 4 boxes Wringers, 15 crates Washers, 32 dozen Tools, 3 dozen Hammers, 1 Scale, 3 dozen Apple Parers, 3 Hay-Cutters, 9 dozen Clocks, 2 2 cases Scales, 50,000 Slate-Pencils, 800 coils Barb Wire, 4 dozen Braces, 2 gross Can-Openers, 3 kegs Nails, 125 cases Plow Parts, 3550 pounds Sash Weights, 75 pounds Cordage, 1 case Hardware.

By H. W. Peabody & Co.—2 gross Blacking, 165 packages Agricultural Implements, 5½ dozen Wringers, 233 packages Hardware, 53 packages Carriage-Ware, 18 cases Clocks, 7 packages Lawn Mowers, 1 case Stamped-Ware, 318 dozen Handles, 1 barrel Blocks, 1 case Step-Ladders, 1 case Bolts, 1000 pounds Nails, 3 crates Fiber-Ware, 8 dozen Stamped-Ware, 4 cases Hardware, 36 cases Agricultural Implements, 33 cases Axes.

## Dressing Show-Windows.

At the present day there is probably no one feature of the retail store which commands more attention than the show-window, for upon its attractiveness depends in a large measure the success of the dealer. In these times every man is making a hard fight for supremacy, and whatever will conduce to this end is eagerly sought by the wide-awake and progressive business man. He realizes that he cannot afford to sleep while his competitor works, and he is therefore constantly on the alert as to what is taking place about him and takes advantage of all information pertaining to his particular line of trade of which he may become possessed. The literature of the subject is not voluminous, but additions are rapidly being made and much that is interesting and valuable is coming out. The following letter from a correspondent of the *American Storekeeper* contains suggestions which are applicable to more than one line of business, and we republish it for the interest it has for retail stove and hardware dealers:

In all well established and regulated retail stores, with pretensions to carrying any classified line of merchandise, a certain degree of attention is, or should be, paid to the art and underlying principles of window dressing, or, in other words, the more stirring class of merchants who pay prompt attention to advertising and to contriving all possible methods of reaching the attention of customers claim show-windows to be one of the great methods.

I think I am correct in saying that the original design of displaying a line of goods by means of large show-windows is often lost and replaced by a less interesting practice of displaying for display alone. That is, showing the complementary colors and not the class of goods that that immediate locality would be at once interested in. It is very nice for one to be sufficiently talented in the art of window dressing to know just how a general assortment of any particular line of goods should be arranged so that they will strike the public eye in one continuous blend of complementary colors and tasteful arrangement, but at the same time the original and underlying idea should not be lost and overlooked, that of showing such goods in your stock as will strike the feminine eye as being the latest styles, or the masculine eye as rare bargains. By thus arranging the taste to suit the design the window becomes a large and varied column of advertisements.

Thus it is that very often the most artistically arranged windows fail to secure the result intended. Now, do not infer from my last statement that I am opposed to fancy window dressing, for I am not. In my conception of a model store there is nothing that adds more to the beauty and symbolic get-up-and-stir of a retail establishment than that of window dressing, or that has more outward appearance of neatness and system. In this connection it may be said (to my regret) that many windows are often packed full of the finest and most elegant styles and novelties, and yet without the least trace or show of an underlying idea of system. In conversation with an experienced window dresser the subject of window trimming was broached, and in the course of his (now to me invaluable) remarks he made the statement that one might study the designs and systems of the arrangements of the most tastefully arranged city show-windows, and then make an attempt at reproducing the subject in all its taste, without the pattern right before the eye, and it would be a signal failure nine times in every ten. From this I draw the conclusion that, instead of the pattern, or idea, being before the eye, the eye must be before the pattern, or, in short, the artistic pattern is in the very brain, and can only be carried to perfection by actual ex-

perience. Right here I may say that many a time has the window dresser been constrained to tear down his pattern only because it did not suit his inward idea.

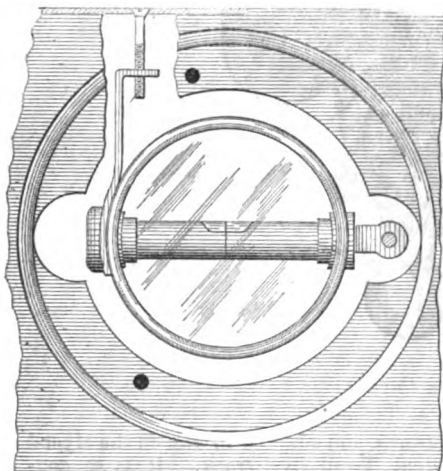
In preparing the window for public attention the dresser must be governed in his taste and arrangement by the class of goods consumed by that particular locality, and not display such goods as belong to the trade of the city merchants. The careful buyer will never have such goods in stock. For illustration, I may say that in the retail dry goods store the display should be made up of goods in which the people are interested and would stop and look at; and when the public eye is forced to pay homage to the window dresser, the original design of window trimming is accomplished—it is then a great advertising medium. In this way, by a careful and not too hasty study, a knowledge of what the trade is most interested in may be acquired; and thus an advertising medium established of as much or sometimes even more value than the long column in the daily or weekly papers. By this expression I do not wish to deny the value of the press as an advertiser, for it is of indispensable value.

The beautiful effect of window shows is sometimes spoiled by a continued sameness. Just as the gossip runs that a new preacher is to preside at the village church next Sunday assures an increased audience to hear something new, so is the effect of a weekly, or, if possible, a semi-weekly, change in the dress of the show-window. The change will always greatly increase the attention of and the interest in that which it contains, so that by so doing people will soon pass your window just to see what you offer new, distinct and apart from the week previous. One would hardly believe such to be the fact unless he actually made the trial. Something I had almost overlooked I must say regarding the consequences of placing too much confidence in certain colors while on display in the window. I can proudly say I have the "consequence" stored permanently in my first experience. Beware of pink and the lighter shades of blue.

They look nice enough in windows, but how disgusting on the job counters. This is why I make this remark, so that an idea may be formed from my own knowledge of perishable colors. Now, I may safely say that in fancy goods stores the window trimming should be always in harmony with the season. There is nothing that looks more ridiculous to the trained eye than to see the winter window arrayed in summer goods and *vice versa*. The changes from month to month and from season to season should be as harmonious and blending as the growth and change of the flowers of the summer months. What I mean in this connection I may illustrate by saying that it would be quite out of good taste to display to any great degree laces and embroideries in the winter months, when the store is full of goods suiting the season and highly necessary to be shown; or to display any heavy woolen goods in summer, when you have new patterns and fancy styles in dress goods, or other novelties suiting the occasion. A careful attention to this will add greatly to the public interest taken in your windows. I have confined my remarks to dry goods from the fact that they are my "building blocks." I do not pretend to be an expert in window dressing at all, but have been simply giving my idea of showing goods and its general advertising connection with any store. And before I conclude my attempt I must pay a necessary honor to all window dressers. They are one of the invaluable methods of advertising. A well-dressed window is one of the greatest outward expressions that can be given by a progressive store—an ever-telling indication of the live and energetic persons within.

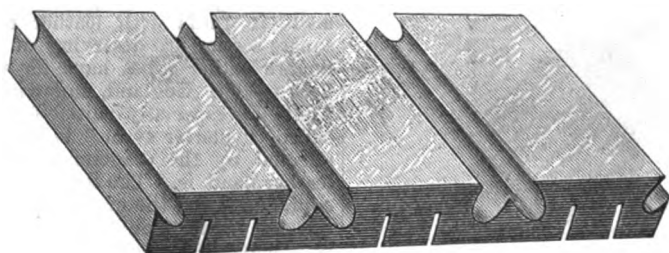
### Cook's Spirit Level.

C. E. Jennings & Co., of 97 Chambers street, New York, are introducing to the trade a spirit level known as Cook's patent. Since 1887 some important improvements have been made in the construction of the level, a general view of some of which is presented by means of the accompanying illustration. The engraving represents a section of the level, showing one of the tubes carrying the bubble. This, it will be observed, is set in a frame faced with glass on either side and placed in the body of the stock. Instead of looking at the top and down into a narrow groove as is usually demanded, the construction of the level is such that the eye is directed to



Sectional View of Cook's Patent Level.

the side and notes at a glance the position of the level. There are two of these tubes used in the level, one being designed for testing vertical lines and the other for leveling. The parts holding the tubes are arranged with screws, as will be readily seen from an inspection of the cut. The screw reaches to the plate on the upper edge of the stock, making the level adjustable and possible to correct for any inaccuracy which may exist. The manufacturers direct special attention to these features of the level, and to the fact that



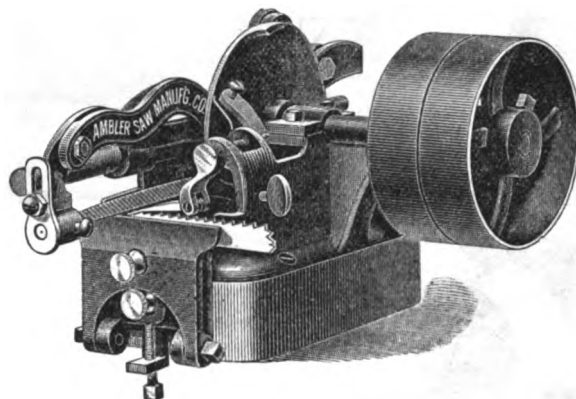
Combined Sheeting and Lath, Manufactured by T. F. Timby, New York.

it can be used in many positions which is not possible with the ordinary device. It is a carefully made instrument, being highly finished, and in its improved form is expected to prove more popular with the trade than ever.

### The Perfect Filing Machine.

The saw-filing machine of which we here-with present an engraving is made by the Ambler Saw Mfg. Company, of Natick, Mass. The saw is held in a vise, as shown, and is raised and lowered by means of a back gauge placed inside the vise and controlled by a thumb-screw from the bottom. The file mechanism consists of two arms, one with a long straight cam-slot and the other with a curved one, both being in connection with a cam-roll on the face-plate.

Each rotation of the face-plate, therefore, gives the file-carriers a reciprocating motion, and, by means of the curved cam-slot, the file is raised at the end of its stroke to free it from the tooth and resumes its position at the proper time to move forward on its cutting stroke. The saw is fed by a pawl cam-follower, all in one piece. The cam-follower being in contact



The Perfect Saw-Filing Machine.

with the cam on the back of the face-plate, as shown in the engraving, each rotation gives it a movement which may be graduated for different lengths of teeth by means of thumb-screws, as shown. The adjustments are quickly made, the time necessary being no more than is always required to put a saw upon ordinary filing-wheels, after which the work is entirely automatic and much more perfect than that done by hand.

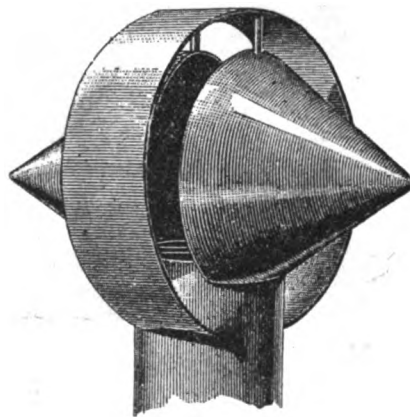
### Combined Sheeting and Lath.

We here present a view of a section of Timby's combined sheeting and lathing, which is being placed upon the market by T. F. Timby, of 32 Warren street, New York City. This lathing is made in 6-inch strips, and so constructed that each section may swell or shrink without affecting those on either side of it. This is accomplished by making in the back deep kerfs which pass the bottom of the face grooves,

spacing of joist or studding is necessary, neither are furring strips required, while the peculiar shape of the grooves is such as to firmly hold the mortar in place. It has the further advantage of using less mortar than the common plan. The lathing is made with both edges finished alike, as shown in the illustration presented herewith, and is supplied six pieces in a

### The Torpedo Ventilator.

From one of our English exchanges we reproduce the engraving of a new form of ventilator. The following description, furnished by our contemporary, is not so full as it might be, but the cut shows the principal features of the device: The accompanying illustration shows a new form of ventilator which has been introduced by the Patent Grate Company, Sheffield, as a thoroughly efficient means of preventing down draft and securing an exhaust action under all atmospheric conditions. It differs essentially from all other forms, either of cowls or ventilators, and no matter in what direction the wind may blow, or what eddies may be formed by the wind rebounding from adjacent roofs, the Torpedo acts just as well as under the

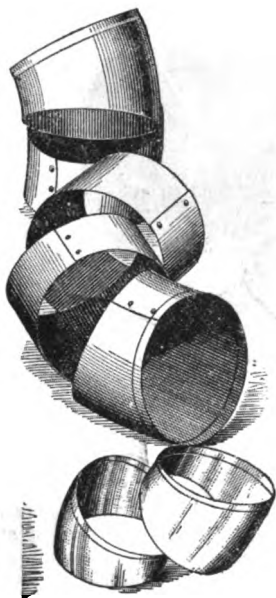


The Torpedo Ventilator.

most favorable conditions. As it is a "fixed" ventilator, and is, therefore, free from all complicated working parts, such as diaphragms or vanes, it is not likely to get out of order, and requires no attention to keep it in a state of efficiency. The London agent is Mr. G. Knowless, Cross street, Finsbury, E. C.

### New Sheet-Metal Elbow.

The National Sheet Metal Roofing Company, of No. 510 East Twentieth street, New York City, are introducing to the trade a sheet-metal elbow for which they make strong claims. The various pieces of which the elbow is composed are formed



New Sheet-Metal Elbow.—Fig. 1.—Sections of Elbow as they come from the Press.

in dies, and when "struck up" present the appearance shown in Fig. 1 of the accompanying illustrations. From an inspection of the pieces in the lower part of the cut it will be seen that the edges are countersunk, allowing the various sections when put together in an elbow to be

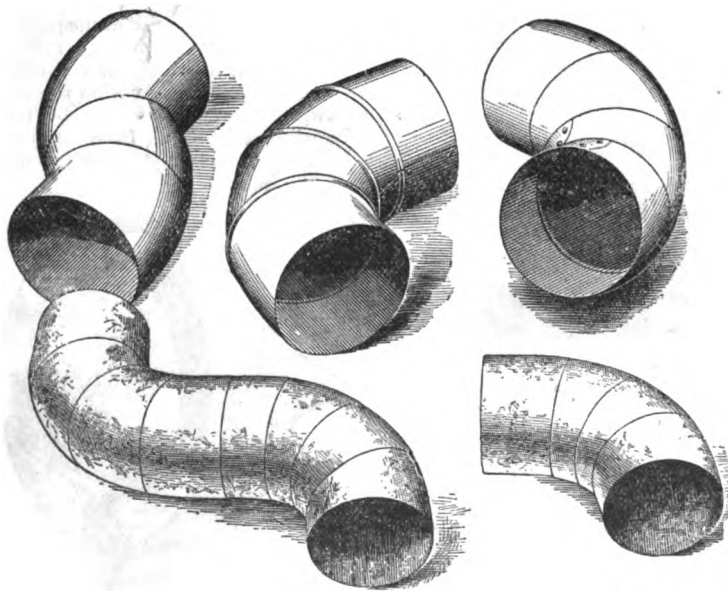


Fig. 2.—Group of Finished Elbows.

flush on the outside. The holes shown in the ends of each piece are for rivets to fasten the ends together. One section of elbow is joined to another by placing the lap over a point upon a mandrel and then using a small rivet set, the result being to give to the elbow the appearance of having been riveted. When the parts are fastened in place the whole elbow is gal-

vanized, giving a very neat and smooth finish. In Fig. 2 of the cuts are shown several finished elbows of the kind above described and also an adjustable elbow which may be used in connection with the fixed one, cases often arising where such a com-

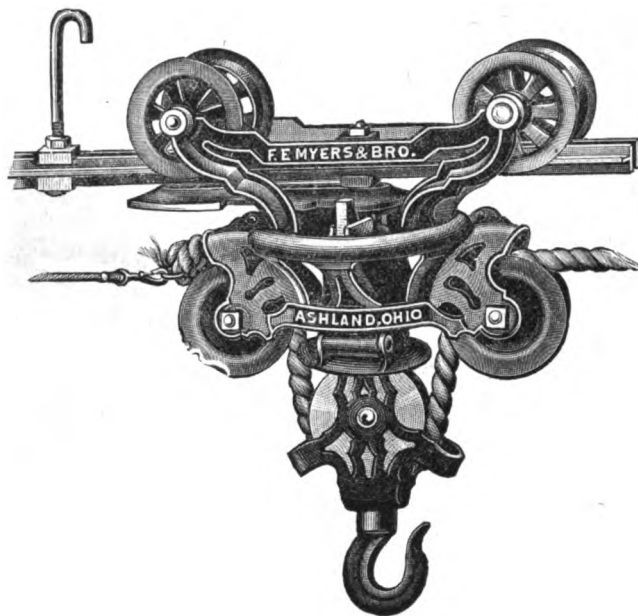
bination could be used to advantage. The makers direct special attention to the facility with which these elbows can be put together and the economy in shipping them "knocked down," the construction being so simple that any sheet-metal worker can readily put the pieces together. In case it is desired to secure a supply of these elbows, a portion of which shall be finished and the remainder in sections as shown in Fig. 1, the latter can be packed within the former, thus greatly reducing the space occupied in transportation. The company at present are offering the trade

two sizes of elbows, but expect soon to have a full line ready.

This will be a bonanza year for fruit and grain growers in California. The value of the California fruit crop this year is estimated at \$24,000,000. The wheat crop is estimated at 70,000,000 bushels, worth \$52,000,000.

### Combination Hay Carrier.

F. E. Myers & Bro., Ashland, Ohio, are manufacturing and putting on the market the hay carrier illustrated herewith. This carrier is referred to as composed of new



Combination Hay Carrier.

patterns, and adapted to run on the Myers' patent T-rail steel track. It is so constructed that it can be used as a straight reversible carrier. The rope can be drawn through the carrier so that it can be operated either way from the stop. The two pulleys over which the rope is drawn are hung on a turn-table or swivel, thus permitting its use as a swivel hay carrier when desired. It is described as made of the best quality of annealed malleable iron, and is equipped with the double lock trips and stop, which is a prominent feature of their well-known Myers' double-lock reversible carrier. The manufacturers refer to the neat and symmetrical appearance of the apparatus and its substantial construction, as well as its reliability.

**Square Driving Ropes.**—According to *Industry*, some experiments recently made in India with leather ropes of a square section are deserving of attention. Square leather ropes have for some time been used in England, and with success. They are especially suited for what are called "quarter twist" belts, not being affected by the diagonal strain as a flat leather band is. The sections are square, equilateral, and the grooves in which they run are made to an angle of 45°, so there is a perfect fit of one-half the surface of the rope, and more than is possible with a flat band of equal weight; not only this, the traction is more because of the angles. The square leather ropes employed for main-driving are about 1½ inches square, made up of layers of leather cemented so the whole is uniform and continuous. A rope of this size weighs 1 pound for each foot of length and will sustain a pull of 600 pounds. A single rope of this size will, at a speed of 2500 feet a minute, transmit 25 horse-power. They are, however, driven at much higher speed than this, in some cases to 6000 feet per minute; a safe or suitable speed is from 4000 to 5000 feet a minute.

Valuable iron ore mines which were recently discovered on the banks of the Orinoco River are being worked and the product is ready to be shipped to Philadelphia. The English steamship *Cypress* will leave with the first cargo of 1800 tons in May, and will receive 15/ per ton freight.



**New Galvanized Sprinkling-Pots.**

Sidney Shepard & Co., Buffalo, N. Y., are manufacturing the new line of sprinkling-pots which is shown in the accompanying illustration. These pots are fitted, it will be observed, with a new style spout, which is double seamed in and has a delivery orifice extra large. The form of

*New Galvanized Sprinkling-Pot.*

the sprinkler heads is also alluded to. These goods are galvanized after being put together, a process which is referred to as soldering all the seams and coating the entire surface. The goods thus made are claimed to be stronger and more durable than tin and of attractive appearance, while cheaper and more substantial than copper. The reasonable price at which they are sold is especially alluded to.

**The Ideal Refrigerator.**

A refrigerator of new and handsome design is offered to the trade by Hibbard, Spencer, Bartlett & Co., of Chicago, who

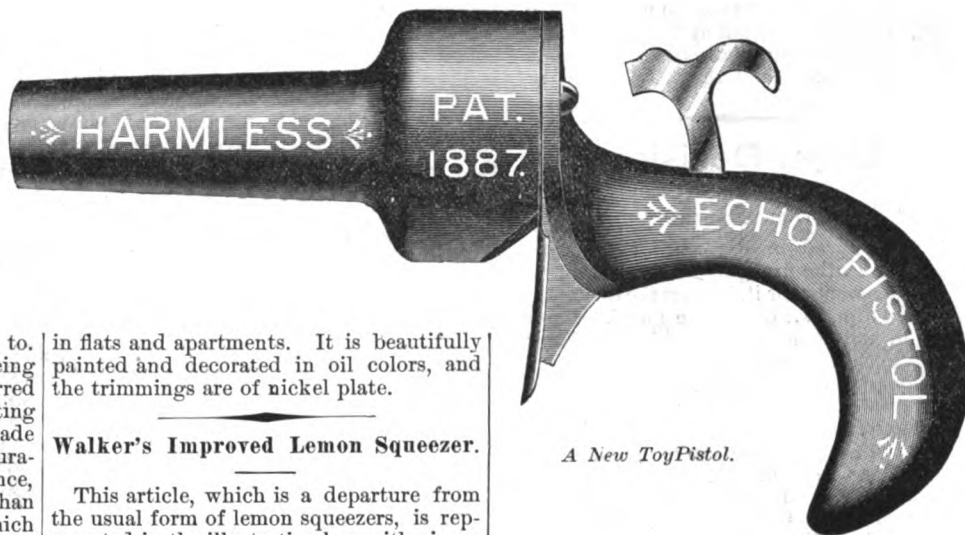
*The Ideal Refrigerator.*

are the sole agents for the manufacturers, the American Fiberware Company, of the same city. An illustration of the refrigerator is shown herewith. It is cylindrical in form, 36 inches high, 22 inches in diameter, and weighs but 40 pounds, being made of compressed wood pulp. The ice is put in at the top, and rests on a corrugated galvanized-iron rack or shelf. The food or provisions are inserted in a door on the side, which opens the full height of the provision-chamber and flush with the bottom, to render cleaning simple and easy. A full circulation of air is secured

by apertures in the ice-chamber which have been arranged for this purpose. The wood pulp being a non-conductor, double walls are not needed, and there is no grain as in wood to shrink or swell, while the inside space is unusually large for its external dimensions as compared with other kinds of refrigerators. It is intended for the use of small families and for dwellers

ing the parts to be taken off for cleaning. The following are the directions for the operation of this machine:

To operate, cut the lemon in halves, placing one piece in the holder and press it in level (allowing it to rest on the pan, which centers it) against the fluted head, at the same time revolve it with the crank a few times, which will flatten out the pulp and extract all the juice, when the peel can be dropped out and the op-

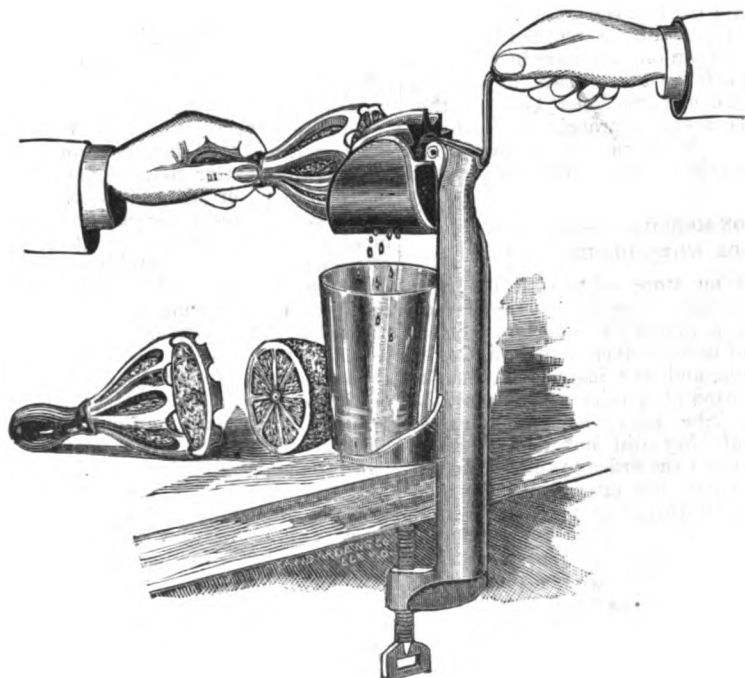
*A New Toy Pistol.***Walker's Improved Lemon Squeezer.**

This article, which is a departure from the usual form of lemon squeezers, is represented in the illustration herewith given, and is manufactured by the Erie Specialty Mfg. Company, Erie, Pa. This machine is designed to be clamped to a shelf or table, and is made high enough to allow a glass to be placed under the catch-pan to receive the juice, which is strained as it passes through the slits in it, the seeds and the pulp being thus kept out of the juice, and the point is made that by this operation all the juice is removed from the lemon without crushing the seeds or peel, thus avoiding the extraction of the bitter oil which is detrimental to the juice. It is also claimed that much more juice is in this way secured than with the ordinary squeezer. The standard of the machine and the clamp are made of iron,

eration repeated. As the oils are all left in the peel, they can be used at a profit for extracts, &c.

**A New Toy Pistol.**

The accompanying illustration represents the Echo pistol, which is made by the Hamblin & Russell Mfg. Company, Worcester, Mass., the cut showing it full size. Its construction is exceedingly simple, the handle being made of iron and the barrel of wood handsomely japanned. In operating the pistol a sharp report is produced without the use of powder or caps, but simply by the mechan-

*Walker's Improved Lemon Squeezer.*

nickel-plated, while the parts coming in contact with the lemon are enameled to prevent corrosion, there being thus no danger of the deleterious effects which are liable to result from the use of galvanized squeezers. The fluted head and pan are held in place by a split spring-pin, allow-

ical operation of the toy. The hammer, shown in the cut, is connected with a piece of steel, the lower part of which is the trigger, and this piece of steel is expanded in the center and given a bound rim, in such a way that it makes a report as it is bent either backward or forward,

and the construction of the large part of the barrel is such as to cause a reverberation, materially increasing the noise. With this construction it will be seen that the report is made in cocking, as well as in firing, the pistol. It can also be made to do service in firing peas or beans. The fact that it is harmless and apparently indestructible are points in its favor. The regular style of the pistol has a bronzed handle, but it is also made nickel-plated. It is intended to retail at 10 cents, and the manufacturers intimate their willingness to send a sample of the pistol by mail at this price.

## Legal Decisions.

### PARTNERSHIP.

M. received in payment of a debt due him by P. the firm check of P. & Co., and got the money for it. After the dissolution of the firm, W., one of the members, went to M. and demanded from him the amount of the check, on the ground that the money belonged to the firm and had been misappropriated. M. refused to refund and W. brought suit. In the action plaintiff sued for the money or moneys of the firm, and the defendant alleged that no recovery could be had on such a statement of facts, and the court sustained him. The case—*Warren vs. Martin*—was then carried to the Supreme Court of Nebraska, where the judgment was affirmed. Judge Cobb, in the opinion, said: "In an action by co-partners against a vendor for the proceeds of a bank-check made by one partner on the firm's bank deposit for goods sold to one member of the firm for his own use, it must be presumed, unless it is alleged to the contrary, that the check was given on account of the partner's interest in the profits of the firm. The rule is when a partner gives the firm check for his own debt it must be presumed that the transaction was fair, and that the debt was paid out of the private funds of the partner indebted. Every check is presumed to be given for value received; it is payable without grace and is an absolute appropriation of so much money in the bank to the holder. To hold the payee to the duty to return the money so received from one partner in payment of his debt it must be made to appear, by allegation and proof, that he knew that the partner was misappropriating the funds of the firm. When there is so much improper appropriation no recovery can be had."

### COMMISSION MERCHANTS—FAILURE TO SELL GOODS WHEN ORDERED—FIRE.

P. had on store with L. & Co., who were commission merchants and warehousemen, a number of bales of cotton, which had been delivered to L. & Co. by her tenants, and she instructed them to sell the cotton at a price which could be obtained. She held the warehouse receipts, but they did not demand them when they got the order to sell. The sale was not made, and after a few days the cotton was destroyed by fire. L. went to P. & Co. and demanded from them the value of those bales, on the ground that as they had not obeyed her instructions she could hold them as though they appropriated the cotton to their own use. They refused to pay her, and she sued for the value of the property and received a judgment, from which the defendants carried the case—*Lehman vs. Pritchett*—to the Supreme Court of Alabama, where the judgment was reversed. Judge Clifton, in the opinion, said: "Commission merchants in their business, duties and liability are substantially the same as factors. The relation in both cases is created only when the property is consigned or received, or is placed at the disposal or under the control of the commission merchant to be sold."

Whenever he receives the property without special instructions as to the time, mode or price, the duty is devolved to use due diligence to sell in a reasonable time; but the duty is not devolved until he receives such possession and power of disposal and control as will enable him to make an effectual sale—to deliver possession and to pass title. Though L. & Co. were conducting business also as warehousemen, under the title of 'the Alabama Warehouse Company,' they were not bound to carry out Mrs. P.'s orders to sell before she dealt with them as commission merchants, by placing the cotton in their hands for sale, and to this end she should, at the least, have delivered to them her warehouse receipts. We have come to the conclusion that, as to her, L. & Co. were not acting as commission merchants. But conceding that they were acting in this relation to her, still, in our opinion, they are not liable to her for the value of the cotton. The fire here is admitted to have been accidental, and the burning of those bales was an accidental and collateral injury to this property, not usually following as the result of any delay by L. & Co., as commission merchants, in making sale of the cotton. If the defendants were bound to sell in a reasonable time and failed to do so, they would be liable only for any injury naturally resulting from the delay, not from an injury suffered from an extraordinary or fortuitous cause, having no relation to the delay, except that it was contemporaneous. In this case the burning of the cotton was the result of an accidental or collateral injury, between which and the delay in selling there was no necessary or rational connection. The fire must be regarded as the proximate and the delay as the remote cause of the loss of the cotton. The damages against the defendants, which the jury were instructed to give, were too remote, and we must reverse the judgment."

### SALE—MONEY PAID TO BE RETURNED IF DISSATISFIED.

P. & Co. made for the T. Mfg. Company a lot of belting, and they gave the purchasers a note for about one-tenth of the price, as a compensation to them should the belting after three years' use show any cause to dissatisfy G., the agent of the T. Mfg. Company, the said note to be paid "promptly on demand of G. or his successor—he was the treasurer of the company—without the intervention of third parties, the matter to rest solely on the decision of G. or his successor." G. declared himself not to be satisfied with the quality and workmanship of the belting after the time limited, and presented the note for payment, but payment was refused on the ground that the belting showed no inferiority after its three years' use, and therefore G. had no reasonable ground whereon to decide that the amount of the note should be paid. Suit was then brought to recover upon the note and the agreement, and P. & Co. set up as a defense the above-stated ground. The company contended that the defense set out was not sufficient in law to prevent judgment being entered for it, and in the case—*Terrapee Mfg. Company vs. Page*—the Supreme Court of Rhode Island gave judgment for the company on the ground that the defense was not sufficient, as stated. The Chief Justice, Durfee, in the opinion, said: "We think the agreement to abide by the decision of G. after a three-years' use of the belting was the very substance of the compromise, and that in the absence of fraud his decision is conclusive. No fraud is alleged in the defense set up; it alleges that the belting answered the requirements of the company, and that G. had no reasonable ground for his decision. But this may be true and yet G.'s decision be honest. The defense must be overruled; the matter of

the decision by the terms of the agreement rested solely on G.'s decision. The stipulation was in effect a submission of the matter, after the three-years' use of the belting, to the unconditional arbitration of G., and it is settled that under such a submission the judgment of the arbitrator, fairly formed, is conclusive."

James P. Witherow, the well-known engineer and contractor, of Pittsburgh, and Hon. William L. Scott, of Erie, Pa., with some capitalists of New York City, have recently secured the franchise of a German syndicate in the Sonora Valley, Mexico, and are now hastening the completion of preparations to develop the great anthracite coal deposit there. The vein is 8 feet thick and is 600 square miles in area. It is situated on the International Railway, about 80 miles from the Gulf of Lower California. They will project a railroad to the gulf and will create facilities for supplying coal for the entire Pacific Coast, from Behring Sea to Patagonia, and for the supply of all the Pacific coaling stations. They will ultimately have a number of collieries and will transport their product, as the Philadelphia and Reading Coal Company now do, in their vessels.

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# CURRENT HARDWARE PRICES.

MAY 15, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers.

## Ammunition.—

### Caps, Percussion, 1000—

Hicks & Goldmark's	50¢
F. L. Waterproof, 1-10's	25¢
E. B. Trimm'd Edge, 1-10's	25¢
E. B. Grnd. Edge, Cent. Fire	25¢
1-10's 70¢	74¢
Double Waterproof, 1-10's	\$1.40
Musket Waterproof, 1-10's	50¢
G. D.	28¢
S. B.	30¢

### Union Metallic Cartridge Co.

F. C. Trimm'd	50¢
F. L. Ground	25¢
Cent. Fire Ground	25¢
Dbl. Waterproof	\$1.40
Dbl. Waterproof, in 1-10's	\$1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D. Waterproof, Central Fire	\$1.60

### Cartridges.

Rim Fire Cartridges	50¢
Rim Fire Military	54¢
Cent. Fire, Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	25¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	2¢
Blank Cartridges, 32 cal., \$1.75	2¢
Blank Cartridges, 32 cal., \$3.50	2¢
Primed Shells and Bullets	16¢
B. B. Caps, Round Ball, \$1.75	2¢
B. B. Caps, Con. Ball, Swgd., \$2.00	2¢

### Primers.

Berdan Primers, \$1.00	2¢
B. L. Caps (for Sturtevant Shells) \$1.00	2¢
All other Primers, \$1.20	2¢

### Shells.

First quality, 4, 8, 10 and 12 gauge	25¢
First quality, 14, 16 and 20 gauge	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge	38¢
Club, Rival and Climax brands, 14, 16 and 20 gauge	30¢
Selfbold's Comb. Shot Shells	15¢
Brass Shot Shells, 1st quality	60¢
Brass Shot Shells, Club, Rival, Climax	65¢
I. X. L. 10 and 12 gauge	40¢
"Special," 16 gauge	30¢
"Special," 10 and 12 gauge	40¢
Fowler's Pat.	\$5.25

### Shells Loaded—

A. M. Co. List No. 10, 1887	20¢
U. M. C. & W. R. A.—B. E., 11 up, \$2.00	20¢
U. M. C. & W. R. A.—B. E., 9&10, 2.30	20¢
U. M. C. & W. R. A.—B. E., 7&8, 2.60	20¢
U. M. C. & W. R. A.—P. E., 11 up, 3.10	20¢
U. M. C. & W. R. A.—P. E., 9&10, 3.40	20¢
U. M. C. & W. R. A.—P. E., 7&8, 4.90	20¢
Eley's B. E., 11 up	\$1.75
Eley's P. E., 11 up	2.80

### Anvils.

Eagle Anvil, 10" x 14"	20¢
Peter Wright's	9¢
Armstrong's Mouse Hole	8¢
Armstrong's Mouse Hole, Extra 11" x 14"	11¢
Trenton	9¢
Wilkinson's	9¢
J. & Riley Carr, Pat. Solid	11¢
Moore & Barnes Mfg. Co.	39¢
Miller's Falls Co., \$18.00	20¢
Cheney Anvil and Vise	35¢
Allen Anvil and Vise, \$3.00	40¢

### Apple Parers—

Advance	7¢
Antrim Combination	5¢
Baldwin	5¢
Champion	7¢
Eureka, 1888	17¢
Family Bay State	12¢
Gem	5¢
Gold Medal	10¢
Hudson's New '88	3¢
Ideal	7¢
Improved Bay State	30¢
Little Star	5¢
Monarch	13¢
New Lightning	5¢
Orion	4¢
Penn.	4¢
Perfection	4¢
Pomona	4¢
Rocking Table	4¢
Turntable	4¢
Victor	13¢
Waverly	4¢
White Mountain	4¢
72	4¢
73	4¢
74	4¢

### Augers and Bits—

Douglas Mfg. Co.	70¢
Wm. A. Ives & Co.	70¢
Humphreysville Mfg. Co.	55¢
French, Swift & Co. (F. H. Beecher)	55¢
Cook's, Douglas Mfg. Co.	50¢
Cook's, N. H. Copper Co.	50¢
Ives Circular Lip	30¢
Patent Solid Head	30¢
C. E. Jennings & Co., No. 10, extension	40¢
C. E. Jennings & Co., No. 30	40¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 32 1/4 quaters, No. 5 & 6, No. 30, \$3.50	30¢
Lewis' Patent Single Twist	25¢
Jennings' Augers and Bits	25¢
Imitation Jennings' Bits	60¢
Pugh's Black	20¢
Car Bits	50¢
L. Hommedieu Car Bits	15¢
Forstner Pat. Auger Bits	10¢

## Hollow Augers—

Ives'	25¢
French, Swift & Co.	25¢
Douglas	25¢
Bonney's Adjustable, 7/8 doz \$48	40¢
Stearns'	20¢
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢

## Expansive Bits—

Clarke's small, \$18; large, \$26	35¢
Ives' No. 4, 7/8 doz \$30	40¢
Swan's	40¢
Stearns' No. 1, \$26; No. 2, \$28	35¢
Stearns' No. 2, \$48	20¢

## Gimlet Bits—

Common	7¢
Diamond	10¢
Bee	25¢
Double Cut, Sheperdson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, 7/8 gr.	45¢
Double Cut, Douglas	40¢
Double Cut, Ives	60¢

## Bit Stock Drills—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	30¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

## Ship Augers and Bits—

L'Hommiedieu's	15¢
Watrous	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

## Awl Hafts—

Sewing, Brass Fer. 7/8 gr. \$3.50	45¢
Pat. Sewing, Short, \$1.00 7/8 doz	40¢
Pat. Sewing, Long, 2 1/2 7/8 gr.	45¢
Pat. Peg, Plain Top, 7/8 \$1.00	45¢
Pat. Peg, Leather Top, 7/8 \$1.20	45¢

## Awls, Brad Sets, &c—

Awls Sewing, Common, 7/8 gr. \$1.70	35¢
Awls Should. Peg, 7/8 gr. \$2.40	40¢
Awls Pat. Peg, 7/8 gr. \$2.40	40¢
Awls Shouldered Brad, 2 1/2 7/8 gr.	45¢
Awls Handled Brad, 7/8 7/8 gr.	45¢
Awls Handled Scratch, 7/8 7/8 gr.	35¢
Awls Socket Scratch, 7/8 7/8 gr.	15¢

## Awl and Tool Sets—

Allen's Sets, Awls and Tools, No. 20, 7/8 doz \$10.00	55¢
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$20	25¢
Miller's Falls Adj. Tool Hds., Nos. 1, \$12; 2, \$18	25¢
Henry's Combination Haft, 7/8 doz \$6.50	35¢
No. 42, \$10.50; No. 43, \$12.50	70¢
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50	30¢

## Axes—

First quality	7¢
Others	5¢

## Makers' and Special Brands—

Fraser's, in boxes, Keg 7/8 doz \$4, Pair 7/8 doz \$8	5¢
Dixon's Everlasting, in boxes, 7/8 doz \$1	12¢
Dixon's Everlasting, 10-b. pairs, ea. 6¢	12¢
Lower grades, special brands	7¢
	5¢

## Axles—

No. 1, 4¢; No. 2, 5¢; No. 3, 6¢; No. 4, 7¢; No. 5, 8¢; No. 6, 9¢; No. 7, 10¢; No. 8, 11¢; No. 9, 12¢; No. 10, 13¢; No. 11, 14¢; No. 12, 15¢; No. 13, 16¢; No. 14, 17¢; No. 15, 18¢; No. 16, 19¢; No. 17, 20¢; No. 18, 21¢; No. 19, 22¢; No. 20, 23¢; No. 21, 24¢; No. 22, 25¢; No. 23, 26¢; No. 24, 27¢; No. 25, 28¢; No. 26, 29¢; No. 27, 30¢; No. 28, 31¢; No. 29, 32¢; No. 30, 33¢; No. 31, 34¢; No. 32, 35¢; No. 33, 36¢; No. 34, 37¢; No. 35, 38¢; No. 36, 39¢; No. 37, 40¢; No. 38, 41¢; No. 39, 42¢; No. 40, 43¢; No. 41, 44¢; No. 42, 45¢; No. 43, 46¢; No. 44, 47¢; No. 45, 48¢; No. 46, 49¢; No. 47, 50¢; No. 48, 51¢; No. 49, 52¢; No. 50, 53¢; No. 51, 54¢; No. 52, 55¢; No. 53, 56¢; No. 54, 57¢; No. 55, 58¢; No. 56, 59¢; No. 57, 60¢; No. 58, 61¢; No. 59, 62¢; No. 60, 63¢; No. 61, 64¢; No. 62, 65¢; No. 63, 66¢; No. 64, 67¢; No. 65, 68¢; No. 66, 69¢; No. 67, 70¢; No. 68, 71¢; No. 69, 72¢; No. 70, 73¢; No. 71, 74¢; No. 72, 75¢; No. 73, 76¢; No. 74, 77¢; No. 75, 78¢; No. 76, 79¢; No. 77, 80¢; No. 78, 81¢; No. 79, 82¢; No. 80, 83¢; No. 81, 84¢; No. 82, 85¢; No. 83, 86¢; No. 84, 87¢; No. 85, 88¢; No. 86, 89¢; No. 87, 90¢; No. 88, 91¢; No. 89, 92¢; No. 90, 93¢; No. 91, 94¢; No. 92, 95¢; No. 93, 96¢; No. 94, 97¢; No. 95, 98¢; No. 96, 99¢; No. 97, 100¢; No. 98, 101¢; No. 99, 102¢; No. 100, 103¢; No. 101, 104¢; No. 102, 105¢; No. 103, 106¢; No. 104, 107¢; No. 105, 108¢; No. 106, 109¢; No. 107, 110¢; No. 108, 111¢; No. 109, 112¢; No. 110, 113¢; No. 111, 114¢; No. 112, 115¢; No. 113, 116¢; No. 114, 117¢; No. 115, 118¢; No. 116, 119¢; No. 117, 120¢; No. 118, 121¢; No. 119, 122¢; No. 120, 123¢; No. 121, 124¢; No. 122, 125¢; No. 123, 126¢; No. 124, 127¢; No. 125, 128¢; No. 126, 129¢; No. 127, 130¢; No. 128, 131¢; No. 129, 132¢; No. 130, 133¢; No. 131, 134¢; No. 132, 135¢; No. 133, 136¢; No. 134, 137¢; No. 135, 138¢; No. 136, 139¢; No. 137, 140¢; No. 138, 141¢; No. 139, 142¢; No. 140, 143¢; No. 141, 144¢; No. 142, 145¢; No. 143, 146¢; No. 144, 147¢; No. 145, 148¢; No. 146, 149¢; No. 147, 150¢; No. 148, 151¢; No. 149, 152¢; No. 150, 153¢; No. 151, 154¢; No. 152, 155¢; No. 153, 156¢; No. 154, 157¢; No. 155, 158¢; No. 156, 159¢; No. 157, 160¢; No. 158, 161¢; No. 159, 162¢; No. 160, 163¢; No. 161, 164¢; No. 162, 165¢; No. 163, 166¢; No. 164, 167¢; No. 165, 168¢; No. 166, 169¢; No. 167, 170¢; No. 168, 171¢; No. 169, 172¢; No. 170, 173¢; No. 171, 174¢; No. 172, 175¢; No. 173, 176¢; No. 174, 177¢; No. 175, 178¢; No. 176, 179¢; No. 177, 180¢; No. 178, 181¢; No. 179, 182¢; No. 180, 183¢; No. 181, 184¢; No. 182, 185¢; No. 183, 186¢; No. 184, 187¢; No. 185, 188¢; No. 186, 189¢; No. 187, 190¢; No. 188, 191¢; No. 189, 192¢; No. 190, 193¢; No. 191, 194¢; No. 192, 195¢; No. 193, 196¢; No. 194, 197¢; No. 195, 198¢; No. 196, 199¢; No. 197, 200¢; No. 198, 201¢; No. 199, 202¢; No. 200, 203¢; No. 201, 204¢; No. 202, 205¢; No. 203, 206¢; No. 204, 207¢; No. 205, 208¢; No. 206, 209¢; No. 207, 210¢; No. 208, 211¢; No. 209, 212¢; No. 210, 213¢; No. 211, 214¢; No. 212, 215¢; No. 213, 216¢; No. 214, 217¢; No. 215, 218¢; No. 216, 219¢; 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**Cards—**

Horse & Curry.....10¢@10¢10¢10¢  
 Cotton.....10¢10¢10¢10¢  
 Wool.....10¢10¢10¢10¢

**Carpet Scrapers—**

Cast Steel, Polished.....\$ doz \$2.25  
 Cast Iron, Steel Points.....\$ doz \$2.00  
 Socket.....\$ doz \$2.00  
 Bullard's.....25¢@25¢10¢

**Carpet Sweepers—**

Bissell No. 5.....\$ doz \$17.00  
 Bissell No. 7 New Drop Pan.....\$ doz \$19.00  
 Bissell, Grand.....\$ doz \$36.00  
 Grand Rapids.....\$ doz \$24.00  
 Crown Jewel, No. 1.....\$18.00; No. 2, \$20.00  
 Magic.....\$ doz \$15.00  
 Jewel.....\$ doz \$17.00  
 Improved Parlor Queen.....\$ doz \$37.00  
 Nickered.....\$ doz \$34.00  
 Japanned.....\$ doz \$32.00  
 Excelsior.....\$ doz \$18.00  
 Garland.....\$ doz \$18.00  
 Parlor Queen.....\$ doz \$24.00  
 Housewife's Delight.....\$ doz \$15.00  
 Queen.....\$ doz \$16.00  
 Queen, with band.....\$ doz \$18.00  
 King.....\$ doz \$20.00  
 Wood, Improved.....\$ doz \$16.00  
 Hub.....\$ doz \$16.00  
 Cog-Wheel.....\$ doz \$22.00  
 Conqueror.....\$ doz \$22.00  
 Easy.....\$ doz \$22.00  
 Monarch.....\$ doz \$22.00  
 Goshen.....\$ doz \$18.00  
 Advance.....\$ doz \$18.00  
 Ladies' Friend, No. 1.....\$ doz \$15.00  
 No. 2.....\$ doz \$16.00  
 American.....\$ doz \$15.00  
 Grand Republic.....\$ doz \$36.00

**Cartridges—**

See Ammunition.

**Casters—**

Bed.....\$55¢@55¢5¢  
 Plate.....\$55¢@55¢5¢  
 Shallow Socket.....\$40¢10¢  
 Deep Socket.....\$40¢10¢  
 Yale Casters, list May, 1884.....\$80¢10¢@40¢  
 Yale, Gem.....\$50¢@50¢5¢  
 Martin's Patent (Phoenix).....\$50¢@50¢10¢  
 Payson's Anti-Friction.....\$50¢@50¢10¢  
 Giant Truck Casters.....\$50¢10¢  
 Stationary Truck Casters.....\$50¢10¢  
 Socket Truck Casters.....\$50¢

**Cattle Leaders—**

Humason, Beckley & Co.'s.....70¢  
 Sargent's.....60¢@10¢  
 Hotchkiss.....80¢  
 Peck, Stow & W. Co.....50¢10¢

**Chain—**

Trace, 6-10-2, exact.....\$ pair \$1.03  
 Trace, 6-10-3, exact.....\$ pair \$2.00  
 Trace, 7-10-2, exact.....\$ pair \$1.11  
 Trace, 7-10-3, exact.....\$ pair \$2.00  
 Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....\$50¢10¢@50¢10¢5¢  
 American Coll, in case lots.....\$ 3-16 1/4 5-16 3/4 7-16 1/2 9-16 3/4 11-16 1/2 13-16 3/4 15-16 1/2 17-16 3/4 19-16 1/2 21-16 3/4 23-16 1/2 25-16 3/4 27-16 1/2 29-16 3/4 31-16 1/2 33-16 3/4 35-16 1/2 37-16 3/4 39-16 1/2 41-16 3/4 43-16 1/2 45-16 3/4 47-16 1/2 49-16 3/4 51-16 1/2 53-16 3/4 55-16 1/2 57-16 3/4 59-16 1/2 61-16 3/4 63-16 1/2 65-16 3/4 67-16 1/2 69-16 3/4 71-16 1/2 73-16 3/4 75-16 1/2 77-16 3/4 79-16 1/2 81-16 3/4 83-16 1/2 85-16 3/4 87-16 1/2 89-16 3/4 91-16 1/2 93-16 3/4 95-16 1/2 97-16 3/4 99-16 1/2 101-16 3/4 103-16 1/2 105-16 3/4 107-16 1/2 109-16 3/4 111-16 1/2 113-16 3/4 115-16 1/2 117-16 3/4 119-16 1/2 121-16 3/4 123-16 1/2 125-16 3/4 127-16 1/2 129-16 3/4 131-16 1/2 133-16 3/4 135-16 1/2 137-16 3/4 139-16 1/2 141-16 3/4 143-16 1/2 145-16 3/4 147-16 1/2 149-16 3/4 151-16 1/2 153-16 3/4 155-16 1/2 157-16 3/4 159-16 1/2 161-16 3/4 163-16 1/2 165-16 3/4 167-16 1/2 169-16 3/4 171-16 1/2 173-16 3/4 175-16 1/2 177-16 3/4 179-16 1/2 181-16 3/4 183-16 1/2 185-16 3/4 187-16 1/2 189-16 3/4 191-16 1/2 193-16 3/4 195-16 1/2 197-16 3/4 199-16 1/2 201-16 3/4 203-16 1/2 205-16 3/4 207-16 1/2 209-16 3/4 211-16 1/2 213-16 3/4 215-16 1/2 217-16 3/4 219-16 1/2 221-16 3/4 223-16 1/2 225-16 3/4 227-16 1/2 229-16 3/4 231-16 1/2 233-16 3/4 235-16 1/2 237-16 3/4 239-16 1/2 241-16 3/4 243-16 1/2 245-16 3/4 247-16 1/2 249-16 3/4 251-16 1/2 253-16 3/4 255-16 1/2 257-16 3/4 259-16 1/2 261-16 3/4 263-16 1/2 265-16 3/4 267-16 1/2 269-16 3/4 271-16 1/2 273-16 3/4 275-16 1/2 277-16 3/4 279-16 1/2 281-16 3/4 283-16 1/2 285-16 3/4 287-16 1/2 289-16 3/4 291-16 1/2 293-16 3/4 295-16 1/2 297-16 3/4 299-16 1/2 301-16 3/4 303-16 1/2 305-16 3/4 307-16 1/2 309-16 3/4 311-16 1/2 313-16 3/4 315-16 1/2 317-16 3/4 319-16 1/2 321-16 3/4 323-16 1/2 325-16 3/4 327-16 1/2 329-16 3/4 331-16 1/2 333-16 3/4 335-16 1/2 337-16 3/4 339-16 1/2 341-16 3/4 343-16 1/2 345-16 3/4 347-16 1/2 349-16 3/4 351-16 1/2 353-16 3/4 355-16 1/2 357-16 3/4 359-16 1/2 361-16 3/4 363-16 1/2 365-16 3/4 367-16 1/2 369-16 3/4 371-16 1/2 373-16 3/4 375-16 1/2 377-16 3/4 379-16 1/2 381-16 3/4 383-16 1/2 385-16 3/4 387-16 1/2 389-16 3/4 391-16 1/2 393-16 3/4 395-16 1/2 397-16 3/4 399-16 1/2 401-16 3/4 403-16 1/2 405-16 3/4 407-16 1/2 409-16 3/4 411-16 1/2 413-16 3/4 415-16 1/2 417-16 3/4 419-16 1/2 421-16 3/4 423-16 1/2 425-16 3/4 427-16 1/2 429-16 3/4 431-16 1/2 433-16 3/4 435-16 1/2 437-16 3/4 439-16 1/2 441-16 3/4 443-16 1/2 445-16 3/4 447-16 1/2 449-16 3/4 451-16 1/2 453-16 3/4 455-16 1/2 457-16 3/4 459-16 1/2 461-16 3/4 463-16 1/2 465-16 3/4 467-16 1/2 469-16 3/4 471-16 1/2 473-16 3/4 475-16 1/2 477-16 3/4 479-16 1/2 481-16 3/4 483-16 1/2 485-16 3/4 487-16 1/2 489-16 3/4 491-16 1/2 493-16 3/4 495-16 1/2 497-16 3/4 499-16 1/2 501-16 3/4 503-16 1/2 505-16 3/4 507-16 1/2 509-16 3/4 511-16 1/2 513-16 3/4 515-16 1/2 517-16 3/4 519-16 1/2 521-16 3/4 523-16 1/2 525-16 3/4 527-16 1/2 529-16 3/4 531-16 1/2 533-16 3/4 535-16 1/2 537-16 3/4 539-16 1/2 541-16 3/4 543-16 1/2 545-16 3/4 547-16 1/2 549-16 3/4 551-16 1/2 553-16 3/4 555-16 1/2 557-16 3/4 559-16 1/2 561-16 3/4 563-16 1/2 565-16 3/4 567-16 1/2 569-16 3/4 571-16 1/2 573-16 3/4 575-16 1/2 577-16 3/4 579-16 1/2 581-16 3/4 583-16 1/2 585-16 3/4 587-16 1/2 589-16 3/4 591-16 1/2 593-16 3/4 595-16 1/2 597-16 3/4 599-16 1/2 601-16 3/4 603-16 1/2 605-16 3/4 607-16 1/2 609-16 3/4 611-16 1/2 613-16 3/4 615-16 1/2 617-16 3/4 619-16 1/2 621-16 3/4 623-16 1/2 625-16 3/4 627-16 1/2 629-16 3/4 631-16 1/2 633-16 3/4 635-16 1/2 637-16 3/4 639-16 1/2 641-16 3/4 643-16 1/2 645-16 3/4 647-16 1/2 649-16 3/4 651-16 1/2 653-16 3/4 655-16 1/2 657-16 3/4 659-16 1/2 661-16 3/4 663-16 1/2 665-16 3/4 667-16 1/2 669-16 3/4 671-16 1/2 673-16 3/4 675-16 1/2 677-16 3/4 679-16 1/2 681-16 3/4 683-16 1/2 685-16 3/4 687-16 1/2 689-16 3/4 691-16 1/2 693-16 3/4 695-16 1/2 697-16 3/4 699-16 1/2 701-16 3/4 703-16 1/2 705-16 3/4 707-16 1/2 709-16 3/4 711-16 1/2 713-16 3/4 715-16 1/2 717-16 3/4 719-16 1/2 721-16 3/4 723-16 1/2 725-16 3/4 727-16 1/2 729-16 3/4 731-16 1/2 733-16 3/4 735-16 1/2 737-16 3/4 739-16 1/2 741-16 3/4 743-16 1/2 745-16 3/4 747-16 1/2 749-16 3/4 751-16 1/2 753-16 3/4 755-16 1/2 757-16 3/4 759-16 1/2 761-16 3/4 763-16 1/2 765-16 3/4 767-16 1/2 769-16 3/4 771-16 1/2 773-16 3/4 775-16 1/2 777-16 3/4 779-16 1/2 781-16 3/4 783-16 1/2 785-16 3/4 787-16 1/2 789-16 3/4 791-16 1/2 793-16 3/4 795-16 1/2 797-16 3/4 799-16 1/2 801-16 3/4 803-16 1/2 805-16 3/4 807-16 1/2 809-16 3/4 811-16 1/2 813-16 3/4 815-16 1/2 817-16 3/4 819-16 1/2 821-16 3/4 823-16 1/2 825-16 3/4 827-16 1/2 829-16 3/4 831-16 1/2 833-16 3/4 835-16 1/2 837-16 3/4 839-16 1/2 841-16 3/4 843-16 1/2 845-16 3/4 847-16 1/2 849-16 3/4 851-16 1/2 853-16 3/4 855-16 1/2 857-16 3/4 859-16 1/2 861-16 3/4 863-16 1/2 865-16 3/4 867-16 1/2 869-16 3/4 871-16 1/2 873-16 3/4 875-16 1/2 877-16 3/4 879-16 1/2 881-16 3/4 883-16 1/2 885-16 3/4 887-16 1/2 889-16 3/4 891-16 1/2 893-16 3/4 895-16 1/2 897-16 3/4 899-16 1/2 901-16 3/4 903-16 1/2 905-16 3/4 907-16 1/2 909-16 3/4 911-16 1/2 913-16 3/4 915-16 1/2 917-16 3/4 919-16 1/2 921-16 3/4 923-16 1/2 925-16 3/4 927-16 1/2 929-16 3/4 931-16 1/2 933-16 3/4 935-16 1/2 937-16 3/4 939-16 1/2 941-16 3/4 943-16 1/2 945-16 3/4 947-16 1/2 949-16 3/4 951-16 1/2 953-16 3/4 955-16 1/2 957-16 3/4 959-16 1/2 961-16 3/4 963-16 1/2 965-16 3/4 967-16 1/2 969-16 3/4 971-16 1/2 973-16 3/4 975-16 1/2 977-16 3/4 979-16 1/2 981-16 3/4 983-16 1/2 985-16 3/4 987-16 1/2 989-16 3/4 991-16 1/2 993-16 3/4 995-16 1/2 997-16 3/4 999-16 1/2 1001-16 3/4 1003-16 1/2 1005-16 3/4 1007-16 1/2 1009-16 3/4 1011-16 1/2 1013-16 3/4 1015-16 1/2 1017-16 3/4 1019-16 1/2 1021-16 3/4 1023-16 1/2 1025-16 3/4 1027-16 1/2 1029-16 3/4 1031-16 1/2 1033-16 3/4 1035-16 1/2 1037-16 3/4 1039-16 1/2 1041-16 3/4 1043-16 1/2 1045-16 3/4 1047-16 1/2 1049-16 3/4 1051-16 1/2 1053-16 3/4 1055-16 1/2 1057-16 3/4 1059-16 1/2 1061-16 3/4 1063-16 1/2 1065-16 3/4 1067-16 1/2 1069-16 3/4 1071-16 1/2 1073-16 3/4 1075-16 1/2 1077-16 3/4 1079-16 1/2 1081-16 3/4 1083-16 1/2 1085-16 3/4 1087-16 1/2 1089-16 3/4 1091-16 1/2 1093-16 3/4 1095-16 1/2 1097-16 3/4 1099-16 1/2 1101-16 3/4 1103-16 1/2 1105-16 3/4 1107-16 1/2 1109-16 3/4 1111-16 1/2 1113-16 3/4 1115-16 1/2 1117-16 3/4 1119-16 1/2 1121-16 3/4 1123-16 1/2 1125-16 3/4 1127-16 1/2 1129-16 3/4 1131-16 1/2 1133-16 3/4 1135-16 1/2 1137-16 3/4 1139-16 1/2 1141-16 3/4 1143-16 1/2 1145-16 3/4 1147-16 1/2 1149-16 3/4 1151-16 1/2 1153-16 3/4 1155-16 1/2 1157-16 3/4 1159-16 1/2 1161-16 3/4 1163-16 1/2 1165-16 3/4 1167-16 1/2 1169-16 3/4 1171-16 1/2 1173-16 3/4 1175-16 1/2 1177-16 3/4 1179-16 1/2 1181-16 3/4 1183-16 1/2 1185-16 3/4 1187-16 1/2 1189-16 3/4 1191-16 1/2 1193-16 3/4 1195-16 1/2 1197-16 3/4 1199-16 1/2 1201-16 3/4 1203-16 1/2 1205-16 3/4 1207-16 1/2 1209-16 3/4 1211-16 1/2 1213-16 3/4 1215-16 1/2 1217-16 3/4 1219-16 1/2 1221-16 3/4 1223-16 1/2 1225-16 3/4 1227-16 1/2 1229-16 3/4 1231-16 1/2 1233-16 3/4 1235-16 1/2 1237-16 3/4 1239-16 1/2 1241-16 3/4 1243-16 1/2 1245-16 3/4 1247-16 1/2 1249-16 3/4 1251-16 1/2 1253-16 3/4 1255-16 1/2 1257-16 3/4 1259-16 1/2 1261-16 3/4 1263-16 1/2 1265-16 3/4 1267-16 1/2 1269-16 3/4 1271-16 1/2 1273-16 3/4 1275-16 1/2 1277-16 3/4 1279-16 1/2 1281-16 3/4 1283-16 1/2 1285-16 3/4 1287-16 1/2 1289-16 3/4 1291-16 1/2 1293-16 3/4 1295-16 1/2 1297-16 3/4 1299-16 1/2 1301-16 3/4 1303-16 1/2 1305-16 3/4 1307-16 1/2 1309-16 3/4 1311-16 1/2 1313-16 3/4 1315-16 1/2 1317-16 3/4 1319-16 1/2 1321-16 3/4 1323-16 1/2 1325-16 3/4 1327-16 1/2 1329-16 3/4 1331-16 1/2 1333-16 3/4 1335-16 1/2 1337-16 3/4 1339-16 1/2 1341-16 3/4 1343-16 1/2 1345-16 3/4 1347-16 1/2 1349-16 3/4 1351-16 1/2 1353-16 3/4 1355-16 1/2 1357-16 3/4 1359-16 1/2 1361-16 3/4 1363-16 1/2 1365-16 3/4 1367-16 1/2 1369-16 3/4 1371-16 1/2 1373-16 3/4 1375-16 1/2 1377-16 3/4 1379-16 1/2 1381-16 3/4 1383-16 1/2 1385-16 3/4 1387-16 1/2 1389-16 3/4 1391-16 1/2 1393-16 3/4 1395-16 1/2 1397-16 3/4 1399-16 1/2 1401-16 3/4 1403-16 1/2 1405-16 3/4 1407-16 1/2 1409-16 3/4 1411-16 1/2 1413-16 3/4 1415-16 1/2 1417-16 3/4 1419-16 1/2 1421-16 3/4 1423-16 1/2 1425-16 3/4 1427-16 1/2 1429-16 3/4 1431-16 1/2 1433-16 3/4 1435-16 1/2 1437-16 3/4 1439-16 1/2 1441-16 3/4 1443-16 1/2 1445-16 3/4 1447-16 1/2 1449-16 3/4 1451-16 1/2 1453-16 3/4 1455-16 1/2 1457-16 3/4 1459-16 1/2 1461-16 3/4 1463-16 1/2 1465-16 3/4 1467-16 1/2 1469-16 3/4 1471-16 1/2 1473-16 3/4 1475-16 1/2 1477-16 3/4 1479-16 1/2 1481-16 3/4 1483-16 1/2 1485-16 3/4 1487-16 1/2 1489-16 3/4 1491-16 1/2 1493-16 3/4 1495-16 1/2 1497-16 3/4 1499-16 1/2 1501-16 3/4 1503-16 1/2 1505-16 3/4 1507-16 1/2 1509-16 3/4 1511-16 1/2 1513-16 3/4 1515-16 1/2 1517-16 3/4 1519-16 1/2 1521-16 3/4 1523-16 1/2 1525-16 3/4 1527-16 1/2 1529-16 3/4 1531-16 1/2 1533-16 3/4 1535-16 1/2 1537-16 3/4 1539-16 1/2 1541-16 3/4 1543-16 1/2 1545-16 3/4 1547-16 1/2 1549-16 3/4 1551-16 1/2 1553-16 3/4 1555-16 1/2 1557-16 3/4 1559-16 1/2 1561-16 3/4 1563-16 1/2 1565-16 3/4 1567-16 1/2 1569-16 3/4 1571-16 1/2 1573-16 3/4 1575-16 1/2 1577-16 3/4 1579-16 1/2 1581-16 3/4 1583-16 1/2 1585-16 3/4 1587-16 1/2 1589-16 3/4 1591-16 1/2 1593-16 3/4 1595-16 1/2 1597-16 3/4 1599-16 1/2 1601-16 3/4 1603-16 1/2 1605-16 3/4 1607-16 1/2 1609-16 3/4 1611-16 1/2 1613-16 3/4 1615-16 1/2 1617-16 3/4 1619-16 1/2 1621-16 3/4 1623-16 1/2 1625-16 3/4 1627-16 1/2 1629-16 3/4 1631-16 1/2 1633-16 3/4 1635-16 1/2 1637-16 3/4 1639-16 1/2 1641-16 3/4 1643-16 1/2 1645-16 3/4 1647-16 1/2 1649-16 3/4 1651-16 1/2 1653-16 3/4 1655-16 1/2 1657-16 3/4 1659-16 1/2 1661-16 3/4 1663-16 1/2 1665-16 3/4 1667-16 1/2 1669-16 3/4 1671-16 1/2 1673-16 3/4 1675-16 1/2 1677-16 3/4 1679-16 1/2 1681-16 3/4 1683-16 1/2 1685-16 3/4 1687-16 1/2 1689-16 3/4 1691-16 1/2 1693-16 3/4 1695-16 1/2 1697-16 3/4 1699-16 1/2 1701-16 3/4 1703-16 1/2 1705-16 3/4 1707-16 1/2 1709-16 3/4 1711-16 1/2 1713-16 3/4 1715-16 1/2 1717-16 3/4 1719-16 1/2 1721-16 3/4 1723-16 1/2 1725-16 3/4 1727-16 1/2 1729-16 3/4 1731-16 1/2 1733-16 3/4 1735-16 1/2 1737-16 3/4 1739-16 1/2 1741-16 3/4 1743-16 1/2 1745-16 3/4 1747-16 1/2 1749-16 3/4 1751-16 1/2 1753-16 3/4 1755-16 1/2 1757-16 3/4 1759-16 1/2 1761-16 3/4 1763-16 1/2 1765-16 3/4 1767-16 1/2 1769-16 3/4 1771-16 1/2 1773-16 3/4 1775-16 1/2 1777-16 3/4 1779-16 1/2 1781-16 3/4 1783-16 1/2 1785-16 3/4 1787-16 1/2 1789-16 3/4 1791-16 1/2 1793-16 3/4 1795-16 1/2 1797-16 3/4 1799-16 1/2 1801-16 3/4 1803-16 1/2 1805-16 3/4 1807-16 1/2 1809-16 3/4 1811-16 1/2 1813-16 3/4 1815-16 1/2 1817-16 3/4 1819-16 1/2 1821-16 3/4 1823-16 1/2 1825-16 3/4 1827-16 1/2 1829-16 3/4 1831-16 1/2 1833-16 3/4 1835-16 1/2 1837-16 3/4 1839-16 1/2 1841-16 3/4 1843-16 1/2 1845-16 3/4 1847-16 1/2 1849-16 3/4 1851-16 1/2 1853-16 3/4 1855-16 1/2 1857-16 3/4 1859-16 1/2 1861-16 3/4 1863-16 1/2 1865-16 3/4 1867-16 1/2 1869-16 3/4 1871-16 1/2 1873-16 3/4 1875-16 1/2 1877-16 3/4 1879-16 1/2 1881-16 3/4 1883-16 1/2 1885



Cross-Cut Saw Handles—  
Atkins' No. 1 Loop, # pair, 80¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.  
Boynton's Loop Saw Handles, 50¢; 80¢.  
Champion.....15¢

**Hangers—**

Barn Door, old patterns.....60¢10¢10¢70¢  
Barn Door, New England.....60¢10¢10¢70¢  
Samson Steel Anti-Friction.....55¢  
Hamilton Wrought Wood Track.....55¢  
U. S. Wood Track.....55¢  
Champion.....60¢10¢  
Rider and Wooster, Medina Mfg. Co.'s  
List.....70¢  
Climax Anti-Friction.....80¢  
Zenith for Wood Track.....55¢  
Reed's Steel Arm.....50¢  
Challenge, Barn Door.....50¢  
Starling's Imp'vd (Anti-Friction).....65¢10¢  
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....50¢25¢  
Cheriton.....50¢10¢  
Kiddier.....50¢10¢60¢  
The Book.....60¢10¢  
Best Anti-Friction.....60¢10¢  
Duplex (Wood Track).....60¢10¢25¢  
Terry's Pat., # dos pr. 4' 2, \$10.00; 5 in. \$12.00.....50¢50¢10¢  
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.....50¢15¢60¢  
Wood Track Iron Clad, # ft. 10'.....50¢

Carrier Steel Anti-Friction.....50¢50¢25¢  
Architect, # set \$6.00.....30¢  
Eclipse.....30¢10¢  
Felix, # set \$4.50.....30¢10¢  
Richards.....30¢30¢10¢  
Lane's Steel Anti-Friction.....40¢10¢  
Ball Bearing Door Hanger.....30¢10¢25¢10¢  
Warner's Pat.....30¢30¢10¢  
Stearns' Anti-Friction.....20¢30¢10¢  
Stearns' Challenge.....25¢10¢35¢10¢10¢  
Faultless.....40¢40¢25¢  
American, # set \$6.00.....30¢10¢  
Rider & Wooster, No. 1, 62¢; No. 2, 76¢.....40¢  
Varagon, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....40¢10¢  
Paragon, Nos. 5, 6, 7 and 8.....30¢10¢  
Crescent.....60¢60¢10¢  
Nickel Cast Iron.....50¢  
Nickel Malleable Iron and Steel.....40¢  
Scranton Anti-Friction Single Strap.....35¢45¢  
Scranton Anti-Friction Double Strap.....40¢  
Universal Anti-Friction.....40¢  
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....45¢  
Star.....40¢10¢40¢10¢25¢  
May.....50¢25¢50¢10¢  
Barry, \$6.00.....40¢10¢

**Harness Snaps—****See Snaps.****Hatchets—**

List Jan. 1, 1888.....35¢40¢  
Isaiah Blood.....35¢40¢  
Hunt's Shingling, Lath and Claw.....40¢25¢  
Hunt's Broad.....40¢  
Buffalo Hammer Co.....40¢10¢50¢  
Hurd's.....40¢10¢50¢  
Fayette R. Plumb.....40¢10¢50¢  
Wm. Mann, Jr., & Co.....50¢50¢25¢  
Underhill Edge Tool Co.....40¢50¢40¢10¢  
Underhill's, Haines and Bright.....35¢45¢  
C. Hammond & Son.....40¢10¢50¢  
Simmons.....40¢10¢50¢  
Peck's.....40¢10¢40¢10¢25¢  
Kelly's.....50¢50¢25¢  
Sargent & Co.....50¢50¢25¢  
Ten Eyck Edge Tool Co.....40¢10¢40¢10¢25¢  
Collins.....10¢  
Schulte, Lohoff & Co.....50¢50¢25¢

**Hay and Straw Knives—**

Lightning, Mfrs. price # dos \$18.00, 25¢  
But jobbers frequently give extras  
Gem.....# dos \$10  
Wadsworth's.....40¢75¢40¢10¢  
Carter's Needle.....# dos \$11.50¢12.00  
Heath's.....# dos \$13.50¢14.00  
Auburn Hay, Com. and Spear Point.....50¢  
Auburn Straw.....40¢  
Noll's Hay.....# dos \$10.00

**Hinges—**

**Wrought Iron Hinges**  
Strap and T.....75¢5¢75¢10¢  
Screw Hook and Strap.....6 to 12 in., # B.....35¢  
Strap.....14 to 20 in., # B.....85¢  
Strap.....22 to 36 in., # B.....95¢  
Heavy Welded Hook.....6 to 12 in., # B.....35¢  
Hook.....14 to 20 in., # B.....85¢  
Screw Hook and Eye.....14 in., # dos \$2.45, 10¢  
Rolled Blind Hinges, Nos. 32 and 33.....50¢10¢  
Rolled Blind Hinges, Nos. 232 and 234.....50¢10¢  
Rolled Plate.....70¢10¢  
Rolled Raised.....70¢10¢  
Plate Hinges, 8, 10 & 12 in., # B.....5¢  
"Providence" over 12 in., # B.....4¢  
**Spring Hinges**  
Geer's Spring and Blank Butts.....40¢  
Union Spring Hinge Co.'s list, March 1888.....30¢  
Acme and U. S.....30¢  
Empire and Crown.....20¢  
Hero and Monarch.....50¢  
American, Gem, and Star, Japaned.....20¢  
American, Gem, and Star, Bronzed.....net  
Oxford, Bronze and Brass.....net  
Barker's Double Acting.....20¢10¢  
Union Mfg. Co.....25¢  
Bommer's.....30¢  
Buckman's.....15¢20¢  
Chicago.....30¢  
Wiles.....10¢  
Devore's.....40¢  
Rex.....40¢  
Royal.....60¢  
Reliable.....60¢  
Champion.....60¢

**Gate Hinges—**

Western.....# dos \$4.40, 60¢  
N. E.....# dos \$7.00, 50¢  
N. E. Reversible.....# dos \$5.20, 55¢10¢  
Clark's, Nos. 1, 2, 3.....60¢10¢25¢  
N. Y. State.....# dos \$5.00, 55¢10¢  
Automatic.....# dos \$12.50, 50¢  
Common Sense.....# dos pair \$4.50, 50¢  
Seymour's.....45¢10¢  
Shepard's.....60¢10¢25¢  
Reed's Latch and Hinges.....# dos \$12.00, 50¢

**Blind Hinges—**

Parker.....75¢25¢  
Palmer.....50¢50¢10¢  
Seymour.....70¢25¢  
Nicholson.....45¢10¢  
Huffer.....50¢

Clark's, Nos. 1, 3, 5, 40 and 50.....75¢10¢50¢80¢  
Clark's Mortise Gravity.....50¢  
Sargent's, Nos. 1, 3, 5, 11, 13.....75¢10¢55¢10¢25¢  
Sargent's, No. 13.....75¢10¢55¢10¢25¢  
Reading's Gravity.....75¢10¢75¢10¢25¢  
Shepard's.....75¢10¢25¢  
Noiseless.....75¢10¢25¢  
Niagara.....80¢25¢  
Buffalo.....80¢25¢  
Clark's Genuine Pat.....80¢25¢  
O. S. Lull & Porter.....75¢10¢  
Acme, Lull & Porter.....75¢10¢  
Queen City Reversible.....75¢10¢  
Clark's Lull & Porter, Nos. 0, 1, 15, 2, 2 1/2, 3.....75¢10¢25¢  
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....25¢25¢

**Hoos—**

**Handled—**  
Garden, Mortar, &c.....65¢  
Planter's, Cotton, &c.....65¢  
Warren Hoe.....60¢  
Magic.....# dos \$4.00

**Eye—**

D. & H. Scovill.....20¢  
Lane's Crescent Planters Pattern.....45¢25¢  
Lane's Razor Blade, Scovill Pattern.....30¢  
Maynard, S. & O. Pat.....45¢25¢  
Sandusky Tool Co., S. & O. Pat.....30¢  
Hubbard & Co., S. & O. Pat.....30¢  
Chattanooga Tool Co., S. & O. Pat.....30¢  
Grub.....60¢60¢10¢

**Hog Rings and Ringers—**

Hill's Improved Ringers.....# dos \$4.25  
Hill's Old Style Ringers.....# dos \$2.75  
Hill's Tongs.....# dos \$2.50  
Hill's Rings.....# dos bxs \$2.15¢2.25  
Perfect Ringers.....# dos bxs \$1.00¢1.70  
Perfect Ringers.....# dos \$2.15¢2.25  
Blair's Hog Ringers.....# dos \$2.25¢2.50  
Blair's Hog Rings.....# dos \$0.45¢1.00  
Champion Ringers.....# dos \$2.00  
Champion Rings, Double.....# dos \$2.25  
Brown's Ringers.....# dos \$2.00  
Brown's Rings.....# dos \$1.25¢1.30

**Hoisting Apparatus—**

Moore's Hand Hoist, with Lock Brake.....30¢  
Moore's Differential Pulley Block.....40¢  
Energy Mfg. Co.'s.....25¢

**Holders, File and Tool—**

Bals Pat.....# dos \$4.00; 25¢  
Nicholson File Holders.....20¢

**Hollow-Ware—****Iron—**

Stove Hollow-Ware—  
Ground.....60¢60¢25¢  
Unground.....60¢10¢60¢10¢10¢  
Enameled Hollow-Ware—  
Maslin Kettles.....65¢10¢  
Boilers and Saucepans.....40¢25¢  
Tinned Boilers and Saucepans.....40¢  
Gray Enameled-Ware—  
Stove.....50¢50¢25¢  
Maslin Kettles.....60¢10¢60¢10¢10¢  
Boilers and Saucepans.....40¢25¢  
Agate and Granite Ware, list Jan. 1, 1889.....35¢45¢10¢  
Rustless Hollow-Ware.....50¢50¢25¢  
Galvanized Tea-Kettles—  
Inch.....6 7 8 9  
Each.....55¢ 60¢ 65¢ 75¢  
Silver Plated—  
4 mo. or 6 x cash in 30 days.  
Reed & Barton.....40¢25¢  
Meriden Britannia Co.....40¢25¢  
Simpson, Hall, Miller & Co.....40¢25¢  
Rogers & Brother.....40¢25¢  
Hartford Silver Plate Co.....40¢25¢  
William Rogers Mfg. Co.....40¢25¢

**Knives—**

Wilson's Butcher Knives.....25¢30¢  
Ames' Butcher Knives.....25¢  
Foster Bros' Butcher, &c.....40¢  
Nichols' Butcher Knives.....40¢10¢  
Ames' Shoe Knives.....20¢25¢  
Ames' Bread Knives, # dos \$1.50, 15¢20¢  
Moran's Shoe and Bread.....30¢  
Hay and Straw.....See Hay Knives  
Table and Pocket.....See Cutlery  
Corn, Auburn Mfg. Co. Western Pat.....\$2.00  
Corn, Auburn Mfg. Co. Crescent.....\$3.50

**Knobs—**

Door Mineral.....65¢68¢  
Door Por. Jap'd.....75¢78¢  
Door Por. Nickel.....\$2.00¢2.25  
Door Por. Plated, Nickel.....\$2.00¢2.25  
Drawer, Precious.....60¢10¢60¢10¢10¢  
Hemlock Door Knobs.....40¢10¢50¢  
Yale & Towne Wood, list Dec. 1888.....40¢  
Furniture Plain.....75¢ gro 10¢10¢  
Furniture, Wood Screws.....25¢10¢  
Base, Rubber Tip.....70¢10¢25¢  
Picture, Judd's.....60¢10¢10¢70¢  
Picture, Sargent's.....70¢10¢  
Picture, Hemlock.....35¢25¢  
Shutter, Porcelain.....65¢10¢  
Carriage, Jap.....# gro 80¢, 60¢10¢

**Ladies—**

Melting, Sargent's.....55¢10¢  
Melting, Reading.....35¢10¢  
Melting, Monroe's Pat.....# dos \$4.00, 40¢  
Melting, F. & S. W.....35¢10¢40¢  
Melting, Warner's.....30¢

**Lawn Mowers—**

Standard List.....50¢10¢  
Quaker City.....60¢10¢  
Enterprise.....60¢10¢

**Lanterns—**

**Tubular**  
Plain with Guards, # dos.....\$4.00¢4.25  
Lift Wire, with Guards.....\$4.50¢4.75  
Square Plain, with Guards.....\$4.00¢4.25  
Sq. Lift Wire, with Guards.....\$4.25¢4.50  
Without Guards, 25¢ # dos less.  
**Miscellaneous.**  
Police, Small, \$6.00; Medium, \$7.25;  
Large, \$9.75.....20¢25¢

**Lemon Squeezers—**

Porcelain Lined, No. 1.....# dos \$3.00, 25¢30¢  
Wood, No. 2.....# dos \$3.00, 35¢  
Wood, Common.....# dos \$1.70¢1.75  
Dunlap's Improved.....# dos \$3.75, 20¢  
Samuels.....No. 1, \$5.00; No. 2, \$6; 12, \$18 # dos.....25¢10¢  
Jennings' Star.....# dos \$2.50  
The Boss.....# dos \$2.50  
Dean's, Nos. 1, # dos \$6.50; 2, \$3.35; 3, \$1.90  
Little Giant.....50¢50¢25¢  
King.....40¢25¢

**Lines—**

Cotton and Linen Fish, Draper's.....60¢  
Draper's Chalk.....60¢  
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....55¢  
Cotton Chalk.....55¢  
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; 10¢  
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 # gr.....25¢  
Mason's Linen No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.....55¢  
Mason's Colored Cotton.....5¢  
Wire Clothes.....18 19 20  
\$3.00 \$3.00 \$3.50

New Haven.....23¢ 24¢ 25¢ 26¢ 27¢ 28¢ 29¢ 30¢ 31¢ 32¢ 33¢ 34¢ 35¢ 36¢ 37¢ 38¢ 39¢ 40¢ 41¢ 42¢ 43¢ 44¢ 45¢ 46¢ 47¢ 48¢ 49¢ 50¢ 51¢ 52¢ 53¢ 54¢ 55¢ 56¢ 57¢ 58¢ 59¢ 60¢ 61¢ 62¢ 63¢ 64¢ 65¢ 66¢ 67¢ 68¢ 69¢ 70¢ 71¢ 72¢ 73¢ 74¢ 75¢ 76¢ 77¢ 78¢ 79¢ 80¢ 81¢ 82¢ 83¢ 84¢ 85¢ 86¢ 87¢ 88¢ 89¢ 90¢ 91¢ 92¢ 93¢ 94¢ 95¢ 96¢ 97¢ 98¢ 99¢ 100¢

**Hose, Rubber—**

Competition.....75¢10¢75¢10¢25¢  
Standard.....70¢70¢10¢  
Extra.....60¢60¢10¢  
N. Y. B. & P. Co., Para.....30¢10¢  
N. Y. B. & P. Co., Extra.....50¢  
N. Y. B. & P. Co., Dundee.....60¢10¢25¢

**Hooks—**

Blair's Adjustable.....# gr \$8.00  
Blair's Adjustable Clipper.....# gr 7.00

**Insulated Fiber-Ware.**

Spittoons, No. 2, # dos.....\$6.75  
Basins, Ringed, # dos, No. 1, \$3.70; No. 2, \$3.10; No. 3.....\$2.70  
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), # dos, nests.....\$16.37  
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), # dos, nests.....\$8.37  
Butter Bowls 15, 17 and 19-inch (3 pieces), # dos, nests.....\$6.75  
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), # set.....\$5.00  
Dry Measures, 1, 2, 4, 8 and 16 qts. (6 pieces), # set.....\$2.25  
See also *Pails*

**Jack Screws—See Screws.**

**Kettles—** Spun Stamped.  
Brass, 7 to 17 in., # B.....24¢ 21¢  
Brass larger than 17 in., # B.....26¢ 23¢  
Enameled and Tea Kettles.....See Hollow-Ware.

**Keys—**

Lock Ass'n list Dec. 30, 1886.....60¢10¢  
Eagle, Cabinet, &c.....35¢45¢  
Hotchkiss' Brass Blanks.....40¢  
Hotchkiss, Copper and Tinned.....40¢  
Hotchkiss' Pad, and Cab.....35¢  
Hotchkiss' Keys.....# dos \$4.00, 15¢  
Wollensak Tinned.....50¢10¢

**Knife Sharpeners—**

Parkin's.....Applewood Handles.....# dos \$6.00, 40¢  
Rosewood or Cocobolo.....# dos \$9.00, 40¢

**Knives—**

Wilson's Butcher Knives.....25¢30¢  
Ames' Butcher Knives.....25¢  
Foster Bros' Butcher, &c.....40¢  
Nichols' Butcher Knives.....40¢10¢  
Ames' Shoe Knives.....20¢25¢  
Ames' Bread Knives, # dos \$1.50, 15¢20¢  
Moran's Shoe and Bread.....30¢  
Hay and Straw.....See Hay Knives  
Table and Pocket.....See Cutlery  
Corn, Auburn Mfg. Co. Western Pat.....\$2.00  
Corn, Auburn Mfg. Co. Crescent.....\$3.50

**Knobs—**

Door Mineral.....65¢68¢  
Door Por. Jap'd.....75¢78¢  
Door Por. Nickel.....\$2.00¢2.25  
Door Por. Plated, Nickel.....\$2.00¢2.25  
Drawer, Precious.....60¢10¢60¢10¢10¢  
Hemlock Door Knobs.....40¢10¢50¢  
Yale & Towne Wood, list Dec. 1888.....40¢  
Furniture Plain.....75¢ gro 10¢10¢  
Furniture, Wood Screws.....25¢10¢  
Base, Rubber Tip.....70¢10¢25¢  
Picture, Judd's.....60¢10¢10¢70¢  
Picture, Sargent's.....70¢10¢  
Picture, Hemlock.....35¢25¢  
Shutter, Porcelain.....65¢10¢  
Carriage, Jap.....# gro 80¢, 60¢10¢

**Ladies—**

Melting, Sargent's.....55¢10¢  
Melting, Reading.....35¢10¢  
Melting, Monroe's Pat.....# dos \$4.00, 40¢  
Melting, F. & S. W.....35¢10¢40¢  
Melting, Warner's.....30¢

**Lawn Mowers—**

Standard List.....50¢10¢  
Quaker City.....60¢10¢  
Enterprise.....60¢10¢

**Lanterns—**

**Tubular**  
Plain with Guards, # dos.....\$4.00¢4.25  
Lift Wire, with Guards.....\$4.50¢4.75  
Square Plain, with Guards.....\$4.00¢4.25  
Sq. Lift Wire, with Guards.....\$4.25¢4.50  
Without Guards, 25¢ # dos less.  
**Miscellaneous.**  
Police, Small, \$6.00; Medium, \$7.25;  
Large, \$9.75.....20¢25¢

**Lemon Squeezers—**

Porcelain Lined, No. 1.....# dos \$3.00, 25¢30¢  
Wood, No. 2.....# dos \$3.00, 35¢  
Wood, Common.....# dos \$1.70¢1.75  
Dunlap's Improved.....# dos \$3.75, 20¢  
Samuels.....No. 1, \$5.00; No. 2, \$6; 12, \$18 # dos.....25¢10¢  
Jennings' Star.....# dos \$2.50  
The Boss.....# dos \$2.50  
Dean's, Nos. 1, # dos \$6.50; 2, \$3.35; 3, \$1.90  
Little Giant.....50¢50¢25¢  
King.....40¢25¢

**Lines—**

Cotton and Linen Fish, Draper's.....60¢  
Draper's Chalk.....60¢  
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....55¢  
Cotton Chalk.....55¢  
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50; 10¢  
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 # gr.....25¢  
Mason's Linen No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.....55¢  
Mason's Colored Cotton.....5¢  
Wire Clothes.....18 19 20  
\$3.00 \$3.00 \$3.50

**Lutes—**

Four-ounce Bottles.....# dos, \$1.75; # gross.....\$17.00

**Mallets—**

Hickory.....20¢10¢20¢10¢10¢  
Lignumvitae.....20¢10¢20¢10¢10¢  
B. & L. Block Co., Hickory & L. V.....30¢30¢10¢

**Match Safes—**

Dangerfield's Self-Igniting.....# dos \$1.50  
Mattecks Regular list.....00¢5¢60¢10¢

**Meat Cutters—**

Dixon's # dos.....40¢25¢  
Nos.....1 2 3 4  
\$14.00 \$17.00 \$19.00 \$30.00  
Woodruff's # dos.....40¢25¢  
Nos.....100 150  
\$15.00 \$18.00

**Champion # dos**

Nos.....200 300 400  
\$22.00 \$27.00 \$40.00  
Hales Pattern # dos.....70¢70¢25¢  
Nos.....1 2 3 4 5  
\$27.00 \$33.00 \$45.00

**Enterprise**

Nos.....1 2 3 4 5  
\$5 \$7 \$10 \$25 \$50 \$60  
Pennyvanis.....\$3 \$2.50 \$4 \$6 \$15  
Nos.....1 2 3 4 5  
\$24.00 \$28.00 \$36.00 \$42.00 \$48.00  
Miles' Challenge # dos.....45¢45¢10¢  
Nos.....1 2 3  
\$22.00 \$30.00 \$40.00

**Home No. 1**

Draw Cut, each.....Nos.....2 6 8  
\$50 \$75 \$80 \$225  
Beef Shavers (Enterprise).....20¢10¢30¢  
Chadborn's Smoked Beef Cutter.....# dos \$6.00

**Mincing Knives—**

Am. (2d quality), # gr. 1 blade, \$7; 2 blades, \$12; 3 blades, \$18.....net  
Lothrop's.....20¢10¢  
Smith's, # dos, Single, \$2.00; Double, \$3.....40¢45¢  
Knapp & Cowles.....50¢10¢60¢  
Buffalo Adjustable.....# dos, \$3.00, 25¢

Ventilator Cord, Samson Braided, White or Drab Cotton.....# dos \$7.50, 30¢  
**Locks, &c.—**

Door Locks, Latches, &c.  
List Dec. 30, '86, chgd Feb. 2, '87.....50¢10¢60¢10¢  
Mallory, Wheeler & Co., list July, '88.....50¢10¢60¢10¢  
Sargent & Co., list Aug. 1, '88, 55¢25¢  
Reading Hardware Co., list Feb. 2, '88.....55¢60¢10¢

Note.—Lower net prices often made.  
Perkins' Burglar Proof.....60¢25¢  
Plate.....35¢25¢  
F. Many's "Extension Cylinder" # \$10.50 # dos.....55¢60¢10¢

Barnes Mfg. Co.....40¢40¢10¢  
Yale.....net prices  
Delta Flat Key.....30¢  
L. & C. Round Key Latches.....30¢10¢  
L. & C. Flat Key Latches.....35¢25¢  
Romer's Night Latches.....15¢  
Shepardson or U. S.....35¢  
Felter or American.....40¢10¢  
Seed's N. Y. Hasp Lock.....25¢

**Cabinets—**  
Eagle, Gaylord Par.....list March, '84, rev. ker and Corbin.....40¢  
Delta, Nos. 36 to 39.....40¢  
Delta, Nos. 51 to 63.....40¢10¢  
Delta, Nos. 86 to 96.....30¢  
Stoddard Lock Co.....30¢25¢  
"Champion" Night Latches.....40¢  
Barnes Mfg. Co.....40¢40¢10¢  
Eagle and Corbin Trunk.....35¢25¢  
"Champion" Cab. and Combin.....35¢45¢  
Yale.....net prices  
Romer's.....25¢

**Padlocks—**  
List Dec. 23, '84.....75¢75¢10¢  
Yale Lock Mfg. Co.'s.....net prices  
Eagle.....25¢25¢  
Bureka, Eagle Lock Co.....40¢25¢  
Romer's, Nos. 0 to 91.....30¢  
Romer's Scandinavian, &c., Nos. 100 to 505.....15¢  
A. E. Dells.....40¢  
Champion Padlocks.....40¢  
Hotchkiss.....30¢  
Star.....45¢  
Horseshoe.....# dos \$6. 40¢40¢10¢  
Barnes Mfg. Co.....30¢  
Noel's.....25¢  
Brown's Pat.....25¢  
Scandinavian.....30¢40¢10¢  
Fralin's Pat. Scandinavian low list.....60¢  
Ames Sword Co. up to No. 150.....40¢  
Ames Sword Co. above No. 150.....50¢

**Lumber Tools.**  
Ring Peavies, "Blue Line".....# dos \$30.00  
Ring Peavies, Common.....# dos \$18.00  
Steel Socket Peavies.....# dos \$21.0

<b>Melasses Gates—</b>	
Stebbin's Pat.	70¢@70¢1/2
Stebbin's Genuine	60¢@10¢1/2
Stebbin's Tinned Ends	40¢10¢
Chase's Hard Metal	50¢10¢
Bush's	20¢
Lincoln's Pattern	70¢@70¢1/2
Weed's	20¢10¢
<b>Boss, 5 doz:</b>	
No. 1, 7¢; No. 2, 8¢; No. 3, 8¢; No. 4, 10¢	50¢@10¢1/2
<b>Money Drawers—</b>	
5 doz, \$18¢@20¢	
<b>Muzzles—</b>	
5 doz, \$3.00, 25¢	

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87	70¢10¢
Wire Nails, Standard Penny	70¢10¢
Wire Nails, Standard Penny	\$2.50@2.60

**Nail Puller—**

Curtiss Hammer	5 doz \$9.00
Giant, No. 1	5 doz \$20.00
Pelican	5 doz \$20.00, 25¢
Boss	5 doz \$30.00, 30¢
Lightnings	5 doz \$21.00

**Nail Sets—**

Square	5 gr., \$4.00@4.25
Round	5 gr., \$3.25
Cannon's Diamond Point	5 gr., \$12.20

**Nut Crackers—**

Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	5 doz \$2.00, 10¢
Turner & Seymour Mfg. Co.	60¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square, Hex.	
Hot Pressed	5.4¢ 5.8¢
Cold Punched	5.4¢ 5.8¢
In lots less than 100 lb., 5 lb., add 1/4¢; 1-lb. boxes, add 1¢ to list.	

**Oakum—**

Government	5 lb 7¢ @ 8¢
U. S. Navy	5 lb 6¢ @ 7¢
Navy	5 lb 5¢ @ 6¢ 1/4

**Oilers—**

Zinc and Tin	65¢@65¢10¢
Brass and Copper	50¢10¢@50¢10¢5¢
Malleable, Hammers, Improved, No. 1, \$3.50; No. 2, \$4.00; No. 3, \$4.40	10¢10¢10¢
Malleable, Hammers, Old Pattern, same list	40¢
Prior's Pat. or "Paragon" Zinc	60¢10¢10¢
Prior's Pat. or "Paragon" Brass	50¢
Olmstead's Tin and Zinc	50¢
Olmstead's Brass and Copper	50¢
Broughton's Zinc	60¢
Broughton's Brass	50¢

**Packing, Steam—**

<b>Rubber—</b>	
Standard	60¢10¢@60¢10¢10¢
Extra	50¢10¢@60¢
N. Y. B. & P. Co., Standard	50¢10¢5¢
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	5¢ 6¢, 30¢
Jenkins' Standard	5¢ 80¢, 35¢

**Miscellaneous—**

American Packing	10¢@11¢ 5 lb
Russia Packing	14¢ 5 lb
Italian Packing	13¢@14¢ 5 lb
Cotton Packing	15¢@17¢ 5 lb
Jute	7¢@8¢ 5 lb

**Padlocks—****See Locks.****Pails—****Galvanized Iron—**

Quarts	10 12 14
Hill's Light Weight	8.75 3.00 3.25
Hill's Heavy Weight	8.00 3.25 3.75
Whiting's	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad	2.75 3.00 3.25
Fire Buckets	2.75 3.25 3.60
Buckets, see Well Buckets	

**Indurated Fibre Ware—**

Star Pails, 12 qt	5 doz \$4.50
Fire, Stable and Milk, 14 qt	5 doz \$5.55

**Pencils—**

Faber's Carpenters'	high list 50¢
Faber's Round Gilt	5 gr \$5.25
Dixon's Lead	5 gr \$4.50
Dixon's Lumber	5 gr \$6.75
Dixon's Carpenters'	40¢10¢

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;	
6 to 7, \$13.00.	60¢5¢@60¢10¢

**Picture Nails—**

Brass Head, Sargent's list	50¢10¢@50¢10¢
Brass Head, Combination list	50¢10¢
Porcelain Head, Sargent's list	50¢10¢10¢
Porcelain Head, Combination list	40¢10¢
Niles' Patent	40¢

**Pinking Irons— 5 doz 65¢ net****Pipe, Wrought Iron—**

<b>List March 23, 1887.</b>	
1 1/2 and under, Plain	55¢
1 1/2 and under, Galvanized	47 1/2¢
1 1/2 and over, Plain	67 1/2¢
1 1/2 and over, Galvanized	55¢
Boiler Tubes, Iron	
1 1/2 and under	57 1/2¢
2 in. to 2 1/2 in.	62 1/2¢
3 in. and larger	65¢

**Planes and Plane Irons—**

<b>Wood Planes—</b>	
Molding	50¢@50¢10¢
Bench, First Quality	60¢@80¢5¢
Bench, Second Quality	60¢10¢@60¢10¢10¢
Bailey's (Stanley R. & L. Co.)	40¢10¢

**Iron Planes—**

Bailey's (Stanley R. & L. Co.)	40¢10¢
Miscellaneous Planes (Stanley R. & L. Co.)	20¢10¢
Victor Planes (Stanley R. & L. Co.)	20¢10¢
Victor's Iron Planes	35¢10¢5¢
Meriden Mill Iron Co.'s	30¢10¢@30¢10¢10¢
Davis's Iron Planes	30¢10¢@30¢10¢10¢
Birmingham Plane Co.	30¢50¢5¢
Gage Tool Co.'s Self-Setting	20¢10¢
Chaplin's Iron Planes	40¢10¢5¢
Sargent's	30¢10¢@30¢10¢10¢

**Plane Irons—**

Plane Irons	20¢10¢
Plane Irons, Butcher's	\$5.00@5.25 to 2
Plane Irons, Buck Bros.	30¢
Plane Irons, Auburn Tool Co., This	40¢
<b>Sandusky Tool Co:</b>	
Single and Cut	30¢
Double	40¢
L. & I. J. White	25¢

**Pliers and Nippers—**

Button's Patent	30¢10¢@40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	\$21.00 5 doz
Humason & Beckley Mfg. Co.	50¢@50¢10¢
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢5¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinnars' Cutting Nippers	add 6¢ dis 10¢
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel, 5 doz, \$12.00, 30¢5¢	
Cronk's 8 in., \$15.00; 10 in. \$22.00	40¢@40¢5¢

**Plumbs and Levels—**

Regular List	70¢10¢@70¢10¢10¢
Diastion's	45¢10¢
Rock Levels	70¢10¢@70¢10¢10¢
Davis Iron Levels	30¢
Davis' Inclinoimeters	10¢10¢

**Polish, Metal.**

Krestoline	20¢10¢
Krestoline Paste	33¢4¢
Gaston's Silver Compound	33¢4¢

**Pokes, Animal—**

Bishop's L. X. L.	5 doz \$6.50
Bishop's O. K.	5 doz \$5.50
Bishop's Pioneer	5 doz \$3.75
Bishop's American	5 doz \$3.00

**Poppers, Corn—**

Round or Square, 1 qt.	5 gr \$12.00@15.00
Round or Square, 2 qt.	5 gr \$25.00@26.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger	5 doz \$36.00
Fletcher Post Hole Augers	5 doz \$35.25
Eureka Diggers	5 doz \$16.00@17.00
Lead's	5 doz \$5.00@9.00
Vaughan's Post Hole Auger	5 doz \$13.00@14.00
Kohler's Little Giant	5 doz \$18.00
Kohler's Hercules	5 doz \$15.00
Kohler's New Champion	5 doz \$15.00
Schneider	5 doz \$18.00
Ryan's Post Hole Diggers	5 doz \$24.00
Cronk's Post Bars	5 doz \$60.00
Gibbs Post Hole Digger	5 doz \$30.00@50¢10¢
Imperial	5 doz \$15.00

**Potato Parers—**

White Mountain	5 doz \$5.00@5.50
Antrim Combination	5 doz \$8.00
Hoosier	5 doz \$18.50

**Pruning Hooks and Shears—**

Diastion's Combined Pruning Hook and Saw	5 doz \$15.00, 20¢10¢
Diastion's Pruning Hook	5 doz \$12.00
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat.	5 doz \$3.75@4.00 net
Henry's Pruning Shears	5 doz \$4.25@4.50 net
Wheeler, M. & C. Co.'s Combination	5 doz \$12.00, 20¢
Dunlap's Saw and Chisel	5 doz \$5.50, 80¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

**Pulleys—**

Hot House, Awning, &c.	60¢10¢
Japanned Screw	60¢10¢
Brass Screw	60¢10¢
Japanned Slide	60¢10¢
Japanned Clothes Line	60¢10¢
Empire Sash Pulley	55¢@60¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye	50¢10¢@50¢10¢5¢
Hay Fork, "Anti-Friction," 5 in. Solid	50¢
Hay Fork, "F" Common and Pat.	20¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	45¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel	50¢
\$12.00	40¢

**Pumps—**

Cistern, Best Makers	50¢10¢@60¢
Pitcher Spout, Best Makers	60¢10¢@60¢
Pitcher Spout, Cheaper Goods	70¢10¢5¢

**Punches—**

Saddlers' or Drive, good	5 doz \$6.00@6.5¢
Bemis & Call Co.'s Cast Steel Drive	50¢5¢
Bemis & Call Co.'s Springfield Socket	50¢5¢
Spring, good quality	5 doz \$2.50@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinnars'	5 doz \$1.44, 55¢
Tinnars' Hollow Punches	20¢2¢
Rice Hand Punches	15¢
Avery's Revolving	30¢10¢
Avery's Saw-Set and Punch. See Saw Sets.	

**Rail—**

Sliding Door, Wrt Brass	5 lb 35¢ 15¢
Sliding Door, Bronzed Wrt Iron	5 lb 7¢
Sliding Door, Iron, Painted	5 foot 4¢, 40¢
Barn Door, Light Iron	5 lb 3¢
Per 100 feet	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hangers	
Small. Med. Large.	
Per 100 feet	\$2.15 2.70 3.25 net
Terry's Wrought Iron	5 foot 4¢@5¢
Victor Track Rail	7¢ 5 foot 50¢2¢
Carrier Steel Rail	5 foot 4¢1¢
Moore's Wrought Iron	25¢

**Rakes—**

Cast Steel, Association goods	65¢
Cast Steel, outside goods	50¢10¢
Malleable	70¢10¢5¢
Gibbs Lawn Rake	\$12.00, 50¢15¢
Canton Lawn Rake	\$9.00, 50¢10¢
Ft. Madison Prize Bow Brace and Peer	less
Fort Madison Steel Tooth Lawn Rake	\$6.00.

**Razors—**

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher	\$10.00 to 2, 10¢

**Razor Strops—**

Genuine Emerson	60¢@60¢5¢
Imitation	5 doz \$3.00, 20¢10¢5¢
Badger's Belt and Com	5 doz 30¢
Lamont Combination	5 doz \$4.00

**Rivets and Burrs—**

Copper	50¢
Iron, list Nov. 17, '87	50¢

**Rivet Sets.**

Reds	50¢10¢
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**Stair, Brass**

Stair, Black Walnut	5 doz 40¢
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**Rollers—**

Barn Door, Sargent's list	60¢10¢10¢
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢

**Rope—**

<b>Manufacturers' prices for large lots:</b>	
Manila, 1/4 in. and larger	5 lb 15¢
Manila, 1/2 in.	5 lb 16¢
Manila, 3/4 in.	5 lb 16¢
Manila, 1 and 5-16 in.	5 lb 15¢
Manila, Tarrad Rope	5 lb 15¢
Manila, Hay Rope	5 lb 15¢
Sisal, 1/4 inch and larger	5 lb 12¢
Sisal, 1/2 in.	5 lb 13¢
Sisal, 3/4 in.	5 lb 13¢
Sisal, 1 and 5-16 in.	5 lb 13¢
Sisal, Hay Rope	5 lb 12¢
Sisal, Tarrad Rope	5 lb 12¢
Sisal, Medium Lathe Yarn	5 lb 11¢
Yotton Rope	5 lb 15¢
Jute Rope	5 lb 8¢

**Rules—**

Boxwood	80¢10¢@80¢10¢10¢
Ivory	50¢@50¢10¢
Starrett's Rules and Straight Edges	25¢10¢

**Sad Irons—**

From 4 to 10, at factory	5 100 lb, \$2.40@2.55
Self-Heating	5 doz \$9.00 net
Self-Heating, 5 doz \$18.00 net	
Self-Heating, 5 doz \$18.00 net	
Mrs. Pott's Irons	40¢@40¢10¢
Enterprise Star Irons	40¢
Combined Fluter and Sad Iron	5 doz \$15.00
Fox Reversible, Self-Fluter	5 doz \$24.00
Chinese Laundry (N.E. Butt Co.)	8¢ 15¢
Serr Eng Idem, Braided, White	4¢ 15¢
Mahony's Troy Pol. Irons	25¢
Sensible	20¢@20¢5¢
National Self-Heating	30¢

**Sand and Emery Paper and Cloth—**

List April 19, 1888	40¢10¢@50¢
Sibley's Emery and Crocus Cloth	50¢

**Sash Cord—**

Common	5 lb 10¢@11¢
Patent, good quality	5 lb 13¢@14¢
White Cotton Braided, fair	5 lb 28¢@30¢
Common Russia Sash	5 lb 13¢
Patent	5 lb 16¢
Cable Laid Italian Sash	5 lb 22¢@24¢
India Cable Laid	5 lb 13¢
<b>Silver Lake—</b>	
A Quality, White, 50¢	10¢10¢5¢
A Quality, Drab, 55¢	10¢10¢5¢
B Quality, White, 50¢	20¢10¢5¢
B Quality, Drab, 55¢	20¢10¢5¢
C Quality, White (only)	25¢@28¢
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 38¢	
Semper Idem, Braided, White	30¢
Egyptian, India Hemp, Braided	25¢

**Samsen—**

Braided, White Cotton, 50¢	30¢@30¢5¢
Braided, Drab Cotton, 55¢	30¢@30¢5¢
Braided, Italian Hemp, 55¢	30¢@30¢5¢
Braided, Litanen, 80¢	30¢@30¢5¢

**Sash Locks—**

Clark's, No. 1, \$10; No. 2, \$8 5 gr.	35¢4¢
Ferguson's	35¢4¢
Morris and Triumph, list Aug. 16, 1886	60¢2¢
Victor	60¢10¢2¢
Walker's	25¢25¢4¢
Atwell Mfg. Co.	65¢@10¢@65¢10¢10¢
Reading	40¢
Hammond's Window Springs	40¢
Common Sense, Jap'd, Cop'd and Brzd	5 gr \$4.00
Common Sense, Nickel Plated	5 gr \$10.00

**Universal.**

Kempshall's Gravity	60¢
Kempshall's Model	60¢@60¢10¢
Corbin's Daisy, list Feb. 15, 1886	70¢
Payson's Perfect	60¢@60¢10¢
Huginin's Sash Balances	25¢&25¢
Huginin's New Sash Locks	25¢&25¢
Stoddard "Practical"	10¢
Ives' Patent	60¢@60¢10¢
Liesche's, Nos. 100 and 110, # gr 88:	
106, \$10.00	20¢10¢
Davis, Bronze, Barnes Mfg. Co.	60¢
Champion Safety, list March 1, 1888	55¢55¢55¢
Security	70¢
Backeye	\$40 \$40 \$40

<b>Machines—</b>	
Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
<b>Bench and Hand—</b>	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	75¢ doz \$2.25
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢40¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls List.....	50¢50¢25¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent's.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns'.....	40¢40¢10¢
<b>Scroll Saws—</b>	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	\$15.....
Barnes' Scroll Saw Blades.....	35¢
<b>Scythe Snaths.....</b>	<b>50¢25¢</b>
<b>Shears—</b>	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning..... See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	75¢ doz \$3.75
Timmers.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	33¢4¢
First quality C. S. Trimmers.....	30¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clipper.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged.....	40¢
Chicago Drop Forge & F. Co., Solid.....	60¢
Steel Forged.....	70¢
Clausen Shear Co. Japanned.....	70¢
Clausen Shear Co. Nickelled, same list.....	60¢
<b>Sheaves—</b>	
<b>Sliding Door—</b>	
M. W. Co., list July, 1888.....	50¢10¢60¢5¢
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	75¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
<b>Sliding Shutter—</b>	
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
<b>Ship Tools—</b>	
L. & I. J. White.....	20¢5¢
Albertson Mfg. Co.....	25¢
<b>Shoes, Horse, Mule, &amp;c.—</b>	
<b>Horse—</b>	
Burden's, Perkins, Phoenix, at factory.....	\$4.00
<b>Mule—</b>	
Add \$1 1/2 keg to above prices.	
<b>Ox, Wrought—</b>	
Ton lots.....	75¢ 9¢
1000 lb lots.....	75¢ 9¢
500 lb lots.....	75¢ 10¢
<b>Shot—</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 75 bag, 25 lb.....	\$1.16
Drop, 75 bag, 5 lb.....	.29
Buck and Chilled, 75 lb bag.....	1.41
Buck and Chilled, 75 lb bag.....	.34
<b>Shovels and Spades—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
Note.—Jobbers frequently give 5¢ 7/16 extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S.....	60¢60¢10¢
Griffith's Solid C. S. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢
St. Louis Shovel Co.....	20¢20¢75¢
Hussey, Binns & Co.....	15¢5¢
Hubbard & Co.....	50¢10¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1886.....	30¢
Remington's (Lowman's) Pat.....	30¢10¢40¢
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢25¢60¢10¢
<b>Shovels and Tongs—</b>	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
<b>Skins, Thimble—</b>	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	20¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
<b>Sieves—</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Shaker (Barber's Pat.) Flour Sifters.....	75¢ doz \$2.00
Electric.....	75¢ \$18.00
Hunter's.....	75¢ \$21.00
Smith's Adjustable Sifters.....	75¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	75¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	75¢ doz \$1.25
<b>Stoves, Wooden Rim—</b>	
Mesh 18, Nested, 75 doz.....	70¢ 90¢
Mesh 20, Nested, 75 doz.....	85¢ \$1.00
Mesh 24, Nested, 75 doz.....	\$1.00 1.10
<b>Slates—</b>	
School, by case.....	40¢
<b>Snaps, Harness, &amp;c.—</b>	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert, New Patent.....	50¢25¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢

<b>Soldering Irons—</b>	
Covert's Adjustable, list Jan. 1, 1886.....	55¢25¢
<b>Spoke Shaves—</b>	
Iron.....	45¢
Wood.....	80¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns'.....	20¢10¢30¢
<b>Spoke Trimmers—</b>	
Bonney's.....	75¢ doz \$10.00, 50¢
Ives' No. 1, \$15.00; No. 2, \$12.00 75¢ doz.....	20¢10¢
Douglas'.....	75¢ doz \$9.00, 20¢
<b>Spoons and Forks—</b>	
<b>Tinned Iron—</b>	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	35¢4¢
<b>Silver Plated—(4 mos. or 5¢ cash 30 days)</b>	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, H. L. Miller & Co.....	50¢10¢60¢
Holmes & Edwards Silver Co.....	50¢10¢60¢
L. Boardman & Son.....	50¢10¢
<b>Miscellaneous.</b>	
Holmes & Edwards Silver Co.: No. 67 Mexican Silver.....	50¢10¢
No. 30 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢50¢5¢
Wm. Rogers Silver, Hall & Elton.....	50¢5¢ cash
Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	30¢
Boardman's Nickel Silver.....	50¢ 2
Boardman's Britannia Spoons, case.....	60¢ 1
<b>Springs—</b>	
Elliptic, Concord, Platform and Half.....	60¢60¢10¢
Cliff's Bolster Springs.....	25¢
<b>Squares—</b>	
Steel and Iron.....	75¢10¢90¢
Nickel Plated.....	60¢10¢60¢10¢
Try Square and T Bevels.....	40¢
Disston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢25¢
<b>Staples—</b>	
Fence Staples, Galvanized.....	Same price as Brd Wire.
Fence Staples, Plain.....	See Trd. Rep.
<b>Steelyards.....</b>	<b>40¢10¢50¢</b>
<b>Stocks and Dies—</b>	
Blacksmith's.....	30¢5¢30¢10¢
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lightning Screw Plates.....	25¢30¢
Reece's New Screw Plates.....	33¢4¢5¢40¢
<b>Stone—</b>	
Hindustan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢.....	
Sand Stone.....	75¢ 2 1/2¢
Washita Stone, Extra.....	75¢ 12¢20¢
Washita Stone, No. 1.....	75¢ 14¢15¢
Washita Stone, No. 2.....	75¢ 10¢11¢
Washita Slips, No. 1, Extra.....	75¢ 36¢38¢
Washita Slips, No. 1.....	75¢ 24¢25¢
Arkansas Stone, No. 1, 4 to 8 in.....	75¢ \$1.50
Arkansas Stone, No. 1, 4 to 9 in.....	75¢ \$1.85
Turkey Oil Stone, 4 to 8 in.....	75¢ \$1.00
Turkey Slips.....	75¢ \$1.00
Lake Superior Slips, Chase.....	75¢ 16¢
Lake Superior Slips, Chase.....	75¢ 31¢32¢
Seneca Stone, Red Paper Brand.....	75¢ 18¢20¢
Seneca Stone, High Rounds.....	75¢ 30¢35¢
Seneca Stone, Small Whets.....	75¢ \$2.00
<b>Stove Polish—</b>	
Joseph Dixon's.....	75¢ gro \$6.00, 10¢
Gem.....	75¢ gro \$4.50, 10¢
Gold Medal.....	75¢ gro \$3.00, 25¢
Mirror.....	75¢ gro \$6.00, 10¢
Lustro.....	75¢ gro \$4.75
Ruby.....	75¢ gro \$3.75
Rising Sun, 5 gro lots.....	75¢ gro \$5.50
Dixon's Plumbago.....	75¢ \$5.00
Boydton's Noon Day.....	75¢ gro \$3.00
Parlor Pride Stove Polish.....	75¢ gro \$3.00
Yates' Liquid.....	75¢ gal \$0.50, 30 70 80 84
Yates Standard Paste Polish, 10 lb cans.....	75¢ 15¢
Jet Black.....	75¢ gro \$3.50
Japanese.....	75¢ gro \$3.50
Firestone.....	75¢ gro \$3.50
Diamond O. K. Enamel.....	75¢ gro \$1.00
Bonnell's Liquid Stove Polish.....	75¢ gro \$0.00
Bonnell's Paste Stove Polish.....	75¢ gro \$0.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	75¢ 12¢
Black Jack Water Paste, 5 and 10 lb cans.....	75¢ 12¢
Nickel Plate Paste.....	75¢ gro \$0.00
<b>Tacks, Brads, &amp;c.—</b>	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢5¢
Steel Carpet.....	80¢80¢5¢
Swedes Iron Carpet.....	80¢80¢5¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners'.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters' or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢5¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢

<b>Common and Patent Brads, 70¢10¢70¢10¢10¢</b>	
Hungarian Nails.....	70¢10¢70¢10¢10¢
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢5¢
Cigar Box Nails.....	50¢10¢60¢10¢5¢
Picture-Frame Points.....	50¢10¢60¢10¢5¢
Looking Glass Tacks.....	50¢10¢60¢10¢5¢
Leathered Carpet.....	50¢10¢60¢10¢5¢
Brush Tacks.....	50¢10¢60¢10¢5¢
Shoe Finders, list Jan. 2, 1888, 10¢10¢	
Lining and Saddle Nails, list Jan. 1, 1888.....	30¢10¢10¢
Silvered.....	20¢10¢10¢
Japanned.....	20¢10¢10¢
Double-Pointed Tacks.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire.	
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....	50¢10¢5¢
<b>Tap Borers—</b>	
Common and Rund.....	20¢10¢
Ive's Tap Borers.....	33¢4¢5¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	33¢4¢35¢
<b>Tapes, Measuring—</b>	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
<b>Thermometers—</b>	
Tin Case.....	80¢80¢10¢
<b>Thimble Skelins—See Skelins.</b>	
<b>Ties, Bale—Steel</b>	
Standard Wire, list.....	50¢10¢5¢
<b>Timners' Shears, &amp;c.—</b>	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢4¢
<b>Tinware—</b>	
Stamped, Japanned and Plated, list Jan. 20, 1887.....	75¢75¢25¢
<b>Tire Benders, Upsetters, &amp;c.—</b>	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
<b>Tobacco Cutters—</b>	
Champion.....	20¢10¢30¢
Wood Bottom.....	75¢ doz \$5.00, \$5.25
All Iron Lock Co's.....	75¢ doz \$18.00, 50¢55¢
Wilson's.....	55¢
Sargent's.....	75¢ doz \$24.55, 10¢
Acme.....	75¢ doz \$20.00, 40¢
<b>Transom Lifters—</b>	
Wollensak's:	
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reith's, list Jan. 1, 1887.....	50¢10¢2
Bronzed Iron Wire.....	75¢ doz \$1.50, 10¢
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
<b>Traps—</b>	
<b>Game—</b>	
Newhouse.....	35¢40¢5¢
Onelida Pattern.....	70¢70¢5¢
Game, Blake's Patent.....	40¢10¢5¢
<b>Mouse and Rat—</b>	
Mouse Wood, Choker, 75¢ doz holes, 11¢12¢	
Mouse, Round Wire.....	75¢ doz \$1.50, 10¢
Mouse, Cage Wire.....	75¢ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	75¢ doz \$2.50, 15¢
Mouse, "Bonanza".....	75¢ gr \$10.00
Mouse Delusion.....	75¢ gr \$15.00
Rat, "Decoy".....	75¢ gr \$10.00, 10¢
Ideal.....	75¢ gr \$15.00
Cyclone.....	75¢ gr \$15.00
Hotchkiss Metallic Mouse, 5-hole traps.....	75¢ doz \$0.90
In full cases.....	75¢ doz 75¢
<b>Trowels—</b>	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diaston's Brk and Plastering.....	25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
<b>Triers—</b>	
Butter and cheese.....	25¢
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co's list '82.....	40¢
<b>Tubes, Boiler—</b>	
See Pipe.	
<b>Twine—</b>	
Flax Twine.....	BC. B.
No. 12, 1/4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 1/4 and 1/2 B Balls.....	21¢ 29¢
No. 18, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 24, 1/4 and 1/2 B Balls.....	18¢ 28¢
No. 36, 1/4 and 1/2 B Balls.....	16¢ 27¢
No. 24, Matras, 1/4 and 1/2 B Balls.....	45¢50¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Manila Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢4¢
3-Ply Hemp, 1/4 B Balls.....	12¢12¢4¢
3-Ply Hemp, 1/4 B Balls.....	11¢11¢4¢
Cotton Wrapping, 5 Balls to b.....	16¢16¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool.....	75¢10¢14¢
Paper.....	75¢10¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
<b>Vises—</b>	
Solid Box.....	60¢60¢5¢
<b>Parallel—</b>	
Fisher & Norris Double Screw.....	15¢10¢
Stephens'.....	25¢30¢

<b>Parker's.....</b>	<b>30¢25¢</b>
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Zinc Glaziers' Points.....	40¢40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢40¢10¢
Herrill's.....	15¢20¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢10¢
Prentiss.....	20¢25¢35¢
Simpson's Adjustable.....	40¢
Moore's.....	30¢
<b>Saw Filers—</b>	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	33¢4¢10¢33¢4¢10¢10¢
Stearns' Silent Saw Vises.....	35¢4¢35¢
Hopkins'.....	60¢4¢10¢
Reading.....	40¢40¢10¢
Wentworth.....	20¢10¢
Combination Hand Vises.....	75¢ \$22.00
Cowell Hand Vises.....	30¢
Bauer's Pipe Vises.....	10¢
<b>Wagon Boxes—</b>	
Per b.....	2 1/2¢
<b>Wagon Jacks—</b>	
Spring.....	25¢
<b>Washer Cutters—</b>	
Smith's Pat.....	75¢ doz \$12.00, 20¢10¢10¢
Johnson's.....	75¢ doz \$11.00, 35¢4¢
Penny's.....	75¢ doz \$11.00, 35¢4¢
Appleton's.....	75¢ doz \$16.00, 60¢10¢
Bonney's.....	75¢ doz \$16.00, 60¢10¢
<b>Washers—</b>	
Size.....	5-16 3/4 1/2 1/2 1/2 1
Washers.....	7 5 1/2 1/2 1/2 1/2 1/2
In lots less than 300 lb, 75¢ add 1/4¢, 5-b boxes 1¢ to list.	
<b>Wedges—</b>	
Iron.....	75¢ 3 1/2¢
Steel.....	75¢ 3 1/2¢





# THE IRON AGE

THURSDAY, MAY 23, 1889

## New Wheel Lathe.

This machine is built from new and improved designs, embodying the most modern ideas for convenience in operating, and is made very strong and stiff to meet the demands for locomotive work of the heaviest class. This lathe will swing wheels 74 inches diameter over tread. The adjustable head is moved along the bed by an improved method that permits of its being located at the exact desired point in a much shorter time than by the ordinary method. The bed consists of three inverted U-sections, the two front ones of which are carried up much higher than is usual, and all are thoroughly united by cross-pieces of same section. This form of bed permits of the use of a very short

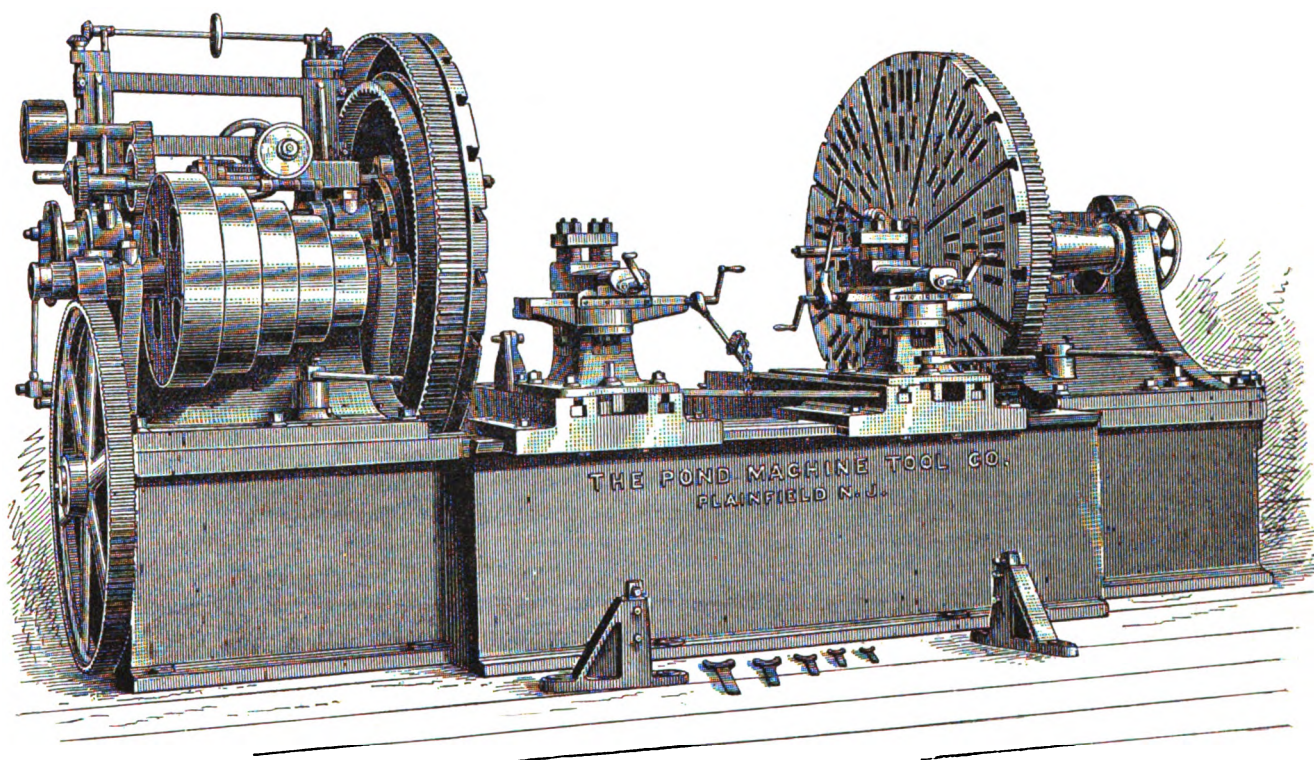
90 revolutions per minute. Single and double quartering attachment can be furnished, and when this is done a positive device for locking the face-plate while boring is provided. This machine is built by the Pond Machine Tool Company, the agents in New York being Manning, Maxwell & Moore, of 111 Liberty street.

## The Cruiser Charleston.

Although the Charleston is the third of the war vessels recently constructed, yet for several reasons her trial trip possesses a special interest and importance. Of her two predecessors one was classed only as a heavy gun-boat and the other as a pneumatic torpedo vessel for harbor defense. The Yorktown is of only about 1700 tons

engines came from the Pacific Rolling Mills, of San Francisco. These include such castings as a stern-post weighing 11,180 pounds, a stem weighing 13,430 and a rudder frame weighing 9420. While the Charleston is the pioneer in ship-building for the Government on the Pacific Coast, the still larger cruiser San Francisco is now under construction by the same firm, the Union Iron Works, and lately the contract for the coast-defense monitor has also been given to them.

The great advance in construction indicated by this vessel is shown by the fact that whereas in the Atlanta the contractor only guaranteed, with 664 tons of machinery, to produce 3500 horse-power, in the Charleston the guarantee is with 710 tons of machinery to produce 7000 horse-power.



SEVENTY-NINE-INCH WHEEL LATHE, BUILT BY THE POND MACHINE TOOL COMPANY.

tool-post, thus materially lessening the strain which is common by reason of the leverage arising from the greater length of the long tool-post ordinarily used. This bed is of sufficient length to admit wheels on the axle fitted with the longest crank-pins without the adjustable head overhanging the end. The tool-posts are furnished with compound slide-rests, and the feeds for the same are positive and universal. The driving-cone has five steps for a 6-inch belt. Each face-plate has ten speeds, and they can be driven together or separately and at the same or different speeds. All gearing is cut from the solid. The face-plate pinions and pinion-shaft are of forged steel, the shaft being of extra large diameter. The slotted hand-wheel on the end of the internal spindle screw, from which the feeds are operated, is so locked to the main spindle that it is impossible for the internal spindle to back out and allow the axle to become loose on the centers. The countershaft is furnished with pulleys for two speeds, and is driven by a belt 6 inches wide. The 42-inch pulley should make 55 revolutions per minute, and the 30-inch pulley should make

displacement, and the Vesuvius of about half as much, while the Charleston is of 3730 tons. The Yorktown's engines develop about 3650 horse-power, while those of the Charleston are guaranteed to produce 7000 horse-power under forced draft, and have been confidently expected to reach double the Yorktown's power. The armament of the Charleston will exceed that of the Yorktown by two 8-inch guns, the highest caliber as yet actually introduced into our war vessels. Thus a great interest is lent to the trials of the Charleston, it being evident that if she should come up to her contract speed there need be no anxiety as to the remaining cruisers of the new fleet now under construction.

A second source of interest in the Charleston is that she is the first war vessel ever built on the Pacific Coast. With the exception of the crank and two shafts made by Krupp, at Essen, all the steel used in her is of domestic manufacture. The beams, outside plating for the hull and the plates for the protective deck were made at Pittsburgh, but the pistons and other forgings for the engines, the frames and all the steel castings for the hull and

In other words, the guarantee in the former case was to produce a little over 5 horse-power per ton of machinery, while in the latter it is to produce nearly 10 horse-power per ton of machinery. Originally the Charleston was meant to carry in her main battery two 10-inch guns and six 6-inch, which would have been an equivalent of the battery of the British-built Japanese vessel of which she is a copy. But finally 8-inch guns were substituted for the 10-inch, so that she is now to carry only the same battery as that of the Boston and the Atlanta, which are of about 700 tons less displacement. The Chicago carries a still heavier battery, consisting of four 8-inch and six 6-inch guns. But, all things considered, the battery of the Charleston is no doubt as heavy as she needs, some of the new English vessels finding that they have gone too far in this respect. At all events, in the Charleston the new navy has a vessel of the highest engine-power yet reached by it, the Chicago only developing a little over 5000 horse-power, and she is surpassed only by the Chicago in offensive strength. With the Dolphin, the Atlanta, the Boston, the

Chicago, the Yorktown, the Charleston and the Petrel, soon to be joined by the Baltimore, our fleet of steel cruisers is rapidly taking on numbers and efficiency.

#### Pig-Iron for Car-Wheels.

A. W. Whitney, chemist of the Whitney Car Wheel Works, of Philadelphia, has furnished to the *Journal of the United States Association of Charcoal Iron-Workers* the following reply to the question, "What are the requirements as to physical characteristics and chemical composition of pig-iron for the manufacture of chilled-iron car-wheels?" :

It is, of course, impossible to lay down any strict rule in regard to the above requirements, as the practice of wheel-makers varies much, some finding a few irons to give good results, while others use many and various irons. In either case an iron may at one time with one mixture work well, and at another time with another mixture be worthless. It cannot be said of such an iron that it is not a good ingredient of car-wheel mixtures, but merely that it will not work well with the particular mixture with which it failed. It is largely the object of the chemist to ascertain with what irons it can be used.

In general, in regard to the physical character of car-wheel pig-iron, the great requirement is uniformity. The character being once ascertained should not vary in different shipments. The chill test on the side of pig is useful; but would it not be well if furnacemen could go further and apply Keep's tests, or an equivalent, to their product? Small sample pigs might be run off from the larger pigs; 50 pounds or less melted in a covered crucible would probably give chill tests and other test pieces which would be useful as an indication of the quality of remelt of the larger pigs. Would not iron graded in this way give more uniform results? This would be an interesting question for practical investigation.

In regard to chemical composition the same may be said. If uniform as received at different times, the wheel-maker will know from his experience, or perhaps in the future from his chemist, in what cases any particular iron may be used. As a rule, I should say that good chilling irons, exclusive of white or mottled, contain between 0.56 and 0.95 per cent. of silicon, though there are some good ones with silicon above and below these limits. White irons often contain less than 0.15 per cent. of silicon. Manganese may be between 0.08 and 0.90 per cent.; phosphorus, 0.05 to 0.75 per cent.; sulphur, 0.0 to 0.15 per cent., and total carbon always as high as the above-mentioned ingredients will allow.

There are, therefore, probably several proper compositions for wheel mixture, each of which depends for its physical success upon the manner of working the iron as to fuel, blast, temperature, &c., and on the relative proportion of one element to another, as well as on the actual amount of each present. Thus some makers may allow as much as 0.95 per cent. silicon in a car-wheel by properly balancing it with other elements, or by special methods. Others using different irons will keep the silicon even below 0.6 per cent. As yet this is generally done empirically, not by deduction from chemical analysis, which, however, within certain limits, as already intimated, can probably predict the results for any given method of working. I am of the opinion that, other things being equal, a small change in chemical composition affects the result; and that a different mode of working affects the result not only directly, but indirectly, by influencing the chemical composition. The following is an analysis of a re-

markably strong wheel with good chill, 33-inch double-plate wheel, weight 569 pounds, cracked slightly at twentieth blow of a Pennsylvania railroad test drop, not broken at 425th blow of same drop. It then broke at the third blow of a 600-pound drop falling 12 feet. The chill of

#### Petroleum-Burning Boiler.

The boiler of which we herewith present an engraving is designed to carry 150 pounds of steam and is rated at 4 horsepower. It measures 20 x 30 inches. Each head is formed of two steel plates placed

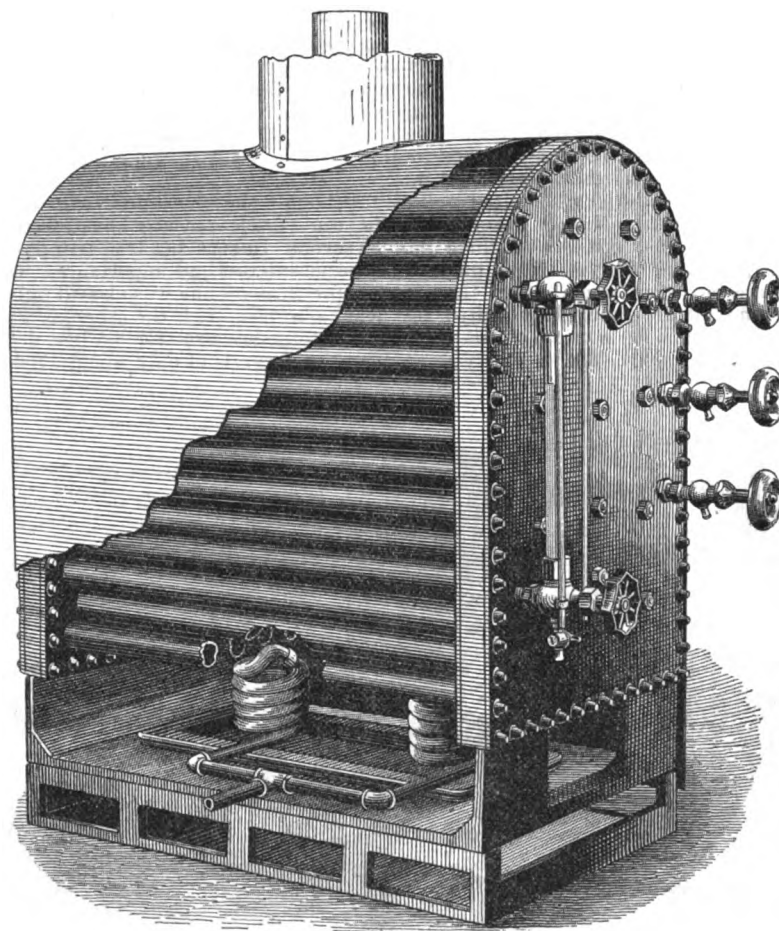


Fig. 1.

#### THE OSBORN BOILER FOR STEAM YACHTS.

this wheel was hard,  $\frac{1}{4}$  inch deep at root of flange and  $\frac{1}{4}$  inch deep in tread:

	Per cent.
Silicon.....	0.734
Manganese.....	0.438
Phosphorus.....	0.428
Sulphur.....	0.080
Total carbon.....	4.330 ? (approximate.)
Graphitic carbon.....	3.083 ? (approximate.)
Combined carbon.....	1.247 ? (approximate.)
Copper.....	0.029

The *Street Railway Gazette* reports that the wire rope made by the Broderick & Bascom Rope Company, of St. Louis, for the Olive street road is running on its thirteenth month of continuous service and has never stranded or had a break. This road runs trains of two coaches and a grip night and morning, and the cars are nearly always crowded. Some time ago a very interesting competitive test of cable ropes took place on the line of the Cincinnati Street Railway Company. Twenty-seven thousand feet of rope were spliced together and put in service, half of which, or 13,500 feet, came from the Broderick & Bascom factory and the other half from that of another works. The other rope wore out and had to be renewed three months before the St. Louis rope showed the least break. On the Grand avenue line in Kansas City one of the Broderick & Bascom ropes is now in service that has outlasted by one-third in time the average term of five previous ropes.

2 inches apart and riveted to a separating channel-bar, as shown. The copper tubes have a shoulder formed on them, against which the inner steel sheets of the heads abut. The burner is intended for the use of petroleum, and is formed of a wrought-iron pipe, coiled as shown, having its upper end capped and bent so as to cross the center line of the coil. The under side of

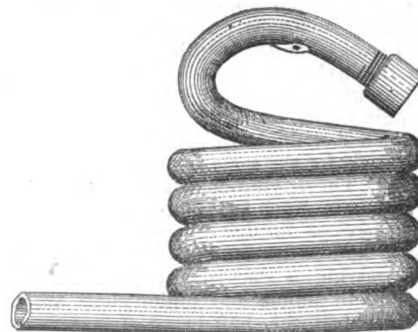


Fig. 2.—The Petroleum Burner.

the cross-bar is provided with a small hole. The two burners are fed with oil from a tank preferably placed near the bow of the boat, and furnished with a small hand air-pump, by means of which an air pressure of a few pounds can be formed in the tank to force the oil through the burner at starting. After the engine has been

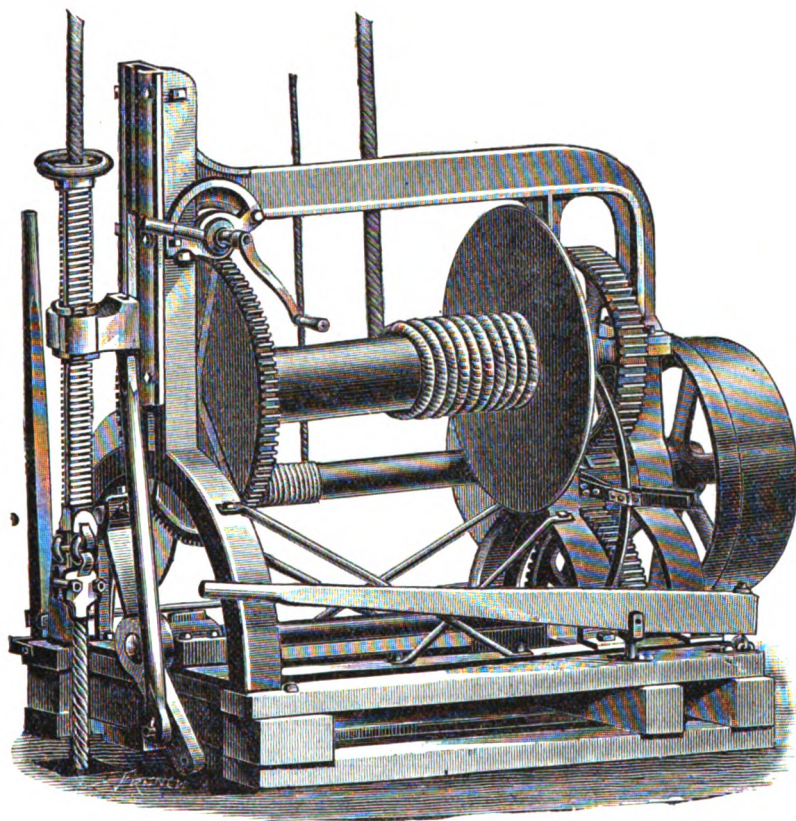


started it is intended that the small auxiliary pump shall supply this pressure. The coil of the burner becomes heated in the downwardly-spreading flame, and the petroleum forced through it is converted into a gas, in which state it is burned as it issues from the vent. It is claimed that this arrangement of the burner, while being exceedingly simple, will generate all the heat required for quick steaming, and is in no danger whatever of clogging. The boiler is provided with the usual glass gauge and water-cocks. The sole agent handling this boiler is J. J. Brockee, of 47 Dey street, New York.

#### Deep-Well Drilling Machine.

In the construction of this drilling machine the aim of the Wells Machine Works, of Fostoria, Ohio, has been to build a practical deep-well machine that would operate any tools which drill by

pendent by a nut journaled in the cross-head, a latch hinged in the the nut locks the nut to the crosshead, and permits the screw to feed out the rope or locks the nut to the screw, leaving the nut and screw free to turn either way. This, it is claimed, is the simplest device possible, and possesses all the advantages of the walking-beam, while doing away with its unwieldy proportions. When the tools are to be withdrawn the temper-screw and all that projects in front of the pitman are hung on one side on a balanced hook. By means of a lever attached to the eccentric through which the shaft of the belt-wheel passes the pinion of the shaft is disengaged from the spur-wheel of the rope-spool shaft. The front flange of the rope-spool is also a worm-wheel, into which the worm is thrown to lock the wheel to suspend the tools. By turning the worm, slack or tension is given to the rope, as may be required. To operate the sand-pump



DEEP-WELL DRILLING MACHINE.

dropping of their own weight, and that would possess all the essential qualities of a drilling machine. The engraving we present shows the machine in position for work after the tool has been sunk beneath the surface. When starting the well the temper-screw is removed, the rope that suspends the drill passes over the sheave in the derrick and down through the rope grip attached to the crosshead of the machine, so that at each downward movement of the crosshead the tools are lifted, and *vice versa*. The rope is readily fed out through the rope grip while in motion. This simple means of spuding, which, in the oil well vocabulary, means the starting of the tool at the surface, is valuable where heavy beds of sand or gravel have to be passed through, as self-pumping tools with drive-weight can be used and the casing kept in advance of the tools. To change from spuding to direct drilling with the temper-screw requires but a little time. The drill rope is held by clamps hinged to the lower end of the temper-screw and is inclosed within the U-shaped recess of the screw, so that it practically forms the center of the screw. The screw is sus-

spool, the pinion on the belt-wheel is placed midway between the spur-wheels. When in this position the friction-wheel of the sand-pump spool is brought in contact with the raised part of the belt-wheel. A powerful foot-brake is brought to bear upon the raised part of the belt-wheel when letting the tools down. With this brake the machine can be stopped almost instantly. The machines are built upon an iron frame, resting upon a solid timber bed thoroughly bolted. The iron frame and the feet of the supports of the machine are planed, so as to make a perfect fit of all the parts of the machine. The shafts are steel, and are strong enough to stop the machine instantly without damage in case the tools catch. The length of the stroke can be readily adjusted to suit the work. The derrick is made in halves for convenience, is hoisted in position by the machine driven by its own power, and where there is proper room one man can readily erect it. It is stated that these machines have been thoroughly tested in deep work with the heaviest tools used in the oil and gas region, and that they have proved superior to any other in their line.

#### The Coke Trade.

Advices from the Connellsville coke region are to the effect that the demand continues fairly active, but present prices are far from satisfactory. The owners of a number of small plants in the region have decided that they cannot produce coke and sell it for \$1 per ton, and as a consequence have closed down their ovens until an improvement takes place. This action has allowed the works which are still in operation to make better time than they otherwise would have done. The H. C. Frick Coke Company and the McClure Coko Company, two of the largest firms in the region, have been operating their works full time for some weeks past. A general cut in wages has been made by the small operators, which has been accepted by the workmen. As yet this example has not been followed by the large operators, but unless there is a decided improvement in the trade at an early date it is more than probable that a general reduction in wages in the entire region will be made. For the week ending on the 11th inst. out of 13,266 completed ovens in the region there were 10,585 in operation and 2681 idle. The record for the previous week showed 10,695 in blast and 2571 idle. The active ovens averaged nearly 5½ days, against 5½ days during the previous week and but 5 days for some weeks prior to that. The estimated production was 99,621 tons, as against 97,151 tons for the previous week. Shipments were as follows: To Pittsburgh and rivers, 1376 cars; to points west of Pittsburgh, 3453; to points east of Connellsville, 1327; total, 6156 cars. The figures for the previous week were: To Pittsburgh, 1215; West, 3348; East, 1215; total, 5778. The shipments, it will be noted, have increased 378 cars. The increase is not confined to any one locality, but is pretty evenly distributed, indicating a faint, but general, revival in demand. Prices are now as low as they have been for years, and the prospect for an improvement is not encouraging. The following are the prices now ruling, f.o.b. cars at point of shipment: Furnace coke, \$1; to dealers, \$1.10; foundry coke, \$1.25; crushed coke, \$1.50, per ton of 2000 pounds. Freight rates from ovens to Pittsburgh, 70 cents per ton; to Shenango Valley, \$1.35; Cleveland, \$2.80; Chicago, \$2.75; East St. Louis, \$3.50; Philadelphia, \$2.89. Foundry prices at Western points are quoted as follows: Chicago, \$4.15; St. Louis, \$4.40; Louisville, \$4.50; Kansas City, \$6.75; Toledo, \$3.85; Detroit, \$3.95; Milwaukee, \$4.20; Buffalo, \$4. In the latter place Reynoldsville coke is quoted at \$3.25 and at Chicago at \$4.25. Walston coke is quoted at \$4.15 in Chicago, and New River coke brings \$4.25 at Louisville.

Inquiry was recently made at the Treasury Department as to whether railway iron can be imported from England for remanufacture into frogs and switches and re-exported to Mexico for use by the Mexican Central Railway without payment of duty. Assistant Secretary Tichenor has informed the inquirer that if the frogs and switches referred to shall be manufactured exclusively of imported material a drawback can be allowed on the exportation of the manufactured articles equal to the amount of duty paid on the imported material used in their manufacture less the legal retention of 10 per cent., but that if any domestic materials whatever are used in the manufacture of said articles no drawback can be obtained thereon. He said also that there is no provision of law under which the imported rails can be manufactured in bond into other articles and exported without payment of duty.

### Cruisers and Battle-Ships.

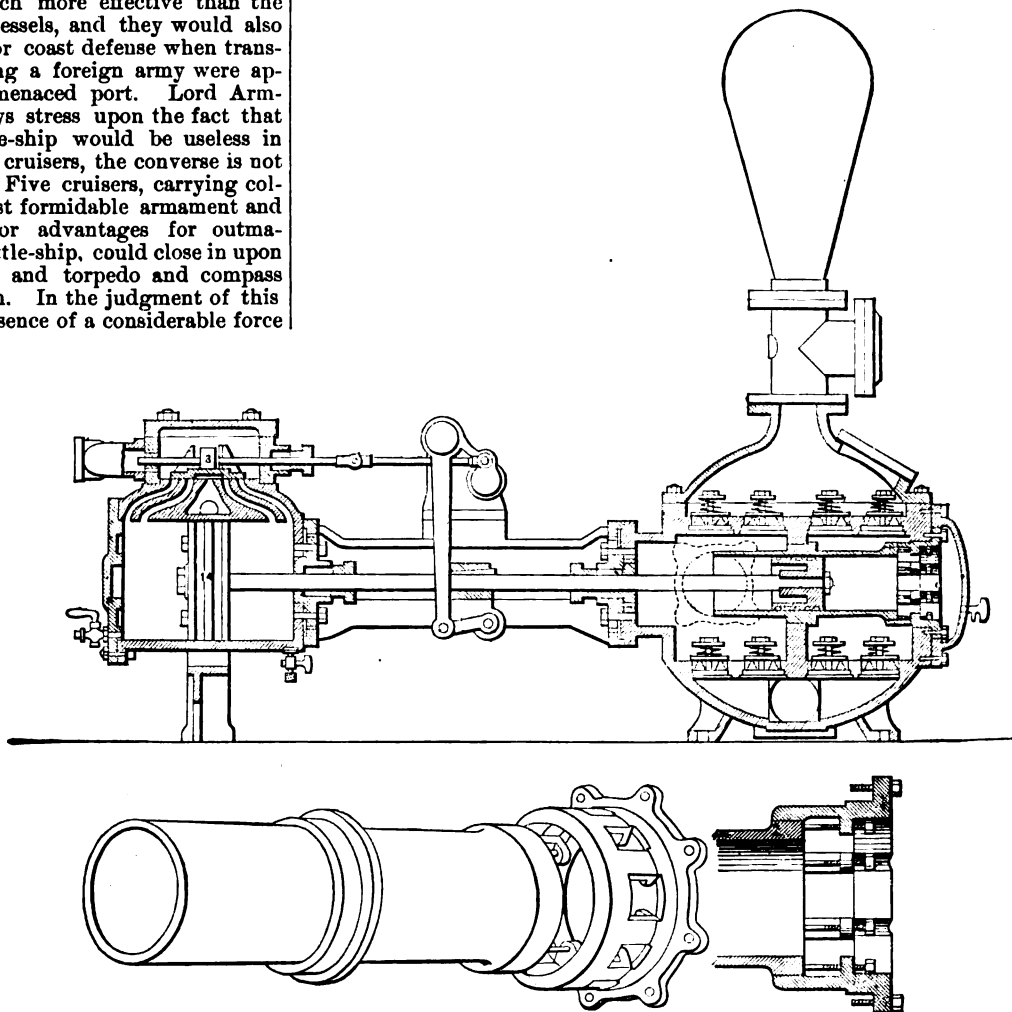
Lord Armstrong contributes to the *Nineteenth Century* an article on the admiralty's ship-building programme which contains many useful hints to Americans interested in the development of their naval resources. There is no greater authority in England on all practical questions relating to modern war-ships, and the importance which he attaches to fast cruisers for defensive and offensive operations is a powerful argument in favor of increased appropriations by Congress for this class of vessels. He considers that the function of armored battle-ships, two of which are now building in American navy yards, is to fight similar vessels. For ordinary purposes of blockade cruisers would be much more effective than the big armored vessels, and they would also be superior for coast defense when transports conveying a foreign army were approaching a menaced port. Lord Armstrong also lays stress upon the fact that while a battle-ship would be useless in hunting down cruisers, the converse is not equally true. Five cruisers, carrying collectively a most formidable armament and having superior advantages for outmaneuvering a battle-ship, could close in upon her with ram and torpedo and compass her destruction. In the judgment of this expert the presence of a considerable force

for a \$45,000 cotton press, but, owing to the uncertainty as to when the works would resume, he was obliged to take it elsewhere. Large orders for sugar-making machinery have also gone elsewhere.

### Water Cylinder of the Buffalo Steam Pump.

Unless otherwise ordered, all of the pumps of the Buffalo (N. Y.) Steam Pump Company are provided with the new water cylinder, of which we present a vertical longitudinal section. The improvement consists of an auxiliary sleeve which supports and holds the removable water barrel or sleeve. It is bolted against

toward sending American workingmen to the Paris Exposition with a view to examining the advance of mechanical arts, this newspaper syndicate stepped into the breach and has undertaken the work which Congress overlooked. They propose to spend anywhere up to \$25,000 in paying all the expenses of 50 American workingmen chosen from St. Louis, Cincinnati, New York, Boston, Detroit, Cleveland, Chicago and other manufacturing points. The details of choosing the men who are to accompany the expedition are now being arranged, and it is not unlikely that representatives from this city may be among those who accompany it. All trades will be represented, including iron-workers, car-workers, ship-builders, car-



NEW WATER CYLINDER OF THE BUFFALO STEAM PUMP.

of unarmored cruisers would compel a hostile fleet of armored battle-ships to herd together for mutual support. It has been the habit of naval engineers and constructors in the United States to refer to the fast cruisers now under contract as possible commerce-destroyers, but not in any sense as fighting ships. Lord Armstrong does not share this view. He believes that they can successfully attack, when in sufficient number, the most powerful battle-ships, whether of the turret or of the barbette system.

### Assets of the Reading Iron Works.

—The appraisers of the property of the Reading Iron Works are about completing their work. It is found that the assets of stock on hand will foot up more than was supposed. Among the items are some 9000 tons of pig-iron, worth about \$125,000. By reason of the stoppage of the works many valuable orders are being lost. A gentleman from New Orleans was here this week who would have placed an order

for the head of the water cylinder and is bored to receive the end of the water barrel. Lugs cast on the inside of the sleeve are tapped for set screws, which are set up against the water barrel, holding it firmly against the partition in the water cylinder, which is bored and faced to receive it. It will be seen from this that the water barrel has two points of bearing, thus giving rigidity to the barrel and holding it in line. It is well-known that all working barrels wear on the lower side first; in this case the barrel can be easily turned so that the wear will be alike on all sides. They are made of iron for ordinary purposes and of composition when used for pumping acid. The pistons, working barrels and auxiliary sleeves can be removed without disconnecting the piping.

One of the most extensive newspaper expeditions ever projected in this country is that which the Scripps League of Western newspapers will send out during the coming July. As Congress took no steps

penters, molders, printers, &c. All workingmen's organizations are invited to correspond with the Manager Paris Expedition Scripps League, Detroit, Mich., concerning the selection of men.

The Aurora Nail Works, one of the largest manufacturing in the State of Indiana, has contracted to move to Merion to secure free gas. The factory expects to employ 500 men.

Beginning June 1 the Canadian Pacific will put on a line of steamers from Chicago to Sault Ste. Marie and form a new sea-board line. The whole line will be out of the jurisdiction of the Interstate act and compete directly with the Grand Trunk. The latter line has a slight advantage, as its lake lines to Sarnia, Midland, &c., are longer. Chicago east-bound lines will get no export business while navigation is open. This looks like war between the Canadian Pacific and the Grand Trunk, as there is nothing to hinder cut rates.



**Automatic Trimming Machine.**

The accompanying engraving represents a new machine for trimming lamp collars and other brass shells, pill and ointment

immediate vicinity. Charges of bad faith have been made against certain members, and these have been followed by the resignation of several firms, which has weakened the organization. It is claimed that

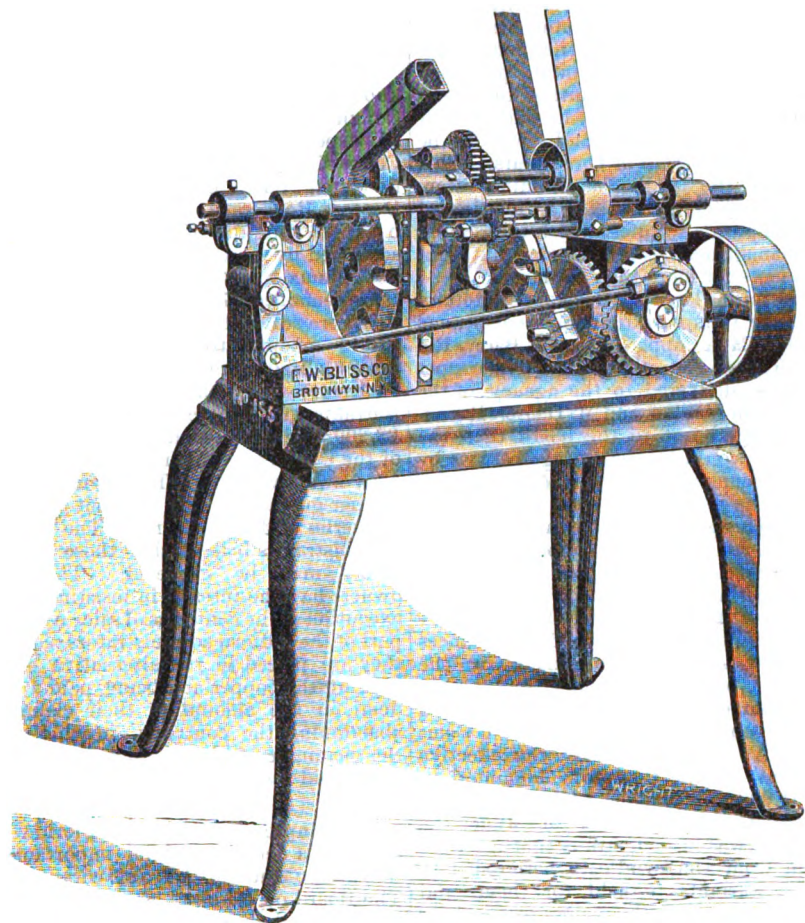
dition of affairs has, no doubt, considerable to do with the present condition of the Western Cut-Nail Association.

**The Lehigh Valley Iron District.**

A press dispatch from Allentown, Pa., quotes William H. Ainey, president of the Lehigh Iron Company, of Allentown, and a prominent banker, on the probable effect of the reduction upon the smaller furnaces in the Lehigh Valley as follows:

The effect upon the smaller furnaces may be somewhat more hurtful than to the Thomas Company, but it is probable that all will be affected alike or substantially so. The reduction had been largely anticipated, and many of the smaller furnaces for several weeks past had been freely selling at about the figures now named by the Thomas Company, simply because it was necessary because of Southern competition to sell at this price or not at all. It is not now thought that the reduction will result in any furnaces going out that are now in. It seems to be the general feeling of the furnacemen here that they must hold their markets and meet Southern competition now or abandon the fight for good. In the hope and expectation that the railroads will ultimately realize that it is in a large measure their fight as well as the furnaces', the battle is likely to go on, and any further reduction by the Southern furnaces will be met by a similar reduction here.

The Lehigh Valley lost its prestige as the largest iron-producing center because of excessive freight charges and fuel cost. When the late David Thomas, of Catsauqua, first succeeded in using anthracite coal for smelting iron ores away back in the forties, hematite ore could be mined and delivered at the furnaces here at \$1.25 a ton, and other materials correspondingly low. The books of some of the furnaces in this region show that anthracite coal cost them before the war only \$1.75 to \$2 a ton delivered at their works, but coal combinations and the excessive and inordinate greed of the railroads changed all this. These hematite ores now cost from



AUTOMATIC TRIMMER.

boxes, covers for baking-powder and other round cans. The operation of the machine is entirely automatic, the shells, as they come from the die being placed in a chute over the feeding-disk, from which they are taken one at a time, carried into position in front of the trimming cutters, securely clamped, trimmed, and thrown out at the rate of 25,000 or more per day. The makers claim that because of the perfection and rapidity of its work this machine is invaluable to manufacturers who produce large numbers of the articles above mentioned, and by reason of its rapidity reduces the cost of trimming to a minimum.

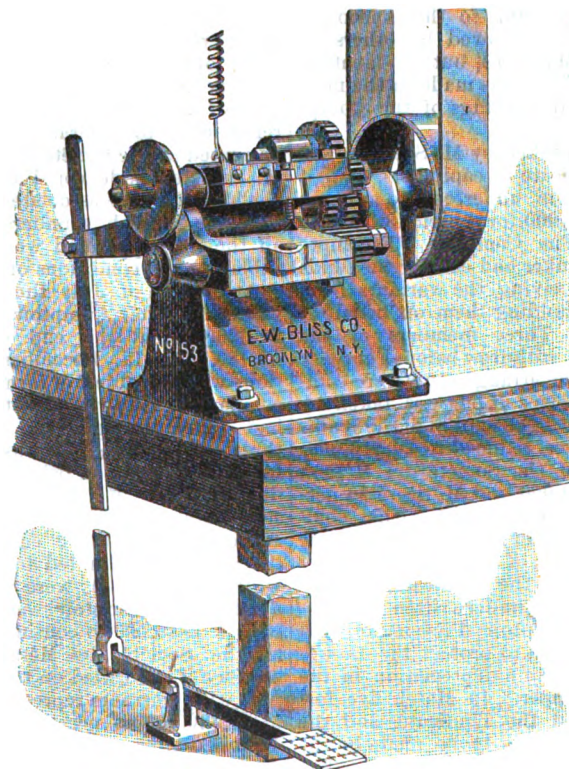
**TRIMMING AND BEADING MACHINE.**

Among the latest machines put on the market for use in the manufacture of sheet-metal goods is the trimming and beading machine herewith illustrated. It can be arranged to run by either hand or steam power, and is used for trimming and beading sheet-metal boxes, covers, collars, &c., 1 inch in diameter and larger. Round, oval, oblong, square or irregular shaped work may be done on this machine provided the corners are round. With suitable rolls and gearing it may be adapted for crimping, swedging and mousing, as well as trimming and beading. The machine is very strongly built, has steel shafts, cut gears, and means of adjustment are provided to keep the cutters in proper position. Both of these machines are built by the E. W. Bliss Company, of Brooklyn, N. Y.

It is stated on very good authority that there are some differences in the ranks of the Western Cut-Nail Association, which is composed almost exclusively of nail manufacturers of Wheeling, W. Va. and

the influence of the association on the nail market has been limited, and that the members of the association are commencing

ing to realize it. There is not a nail factory in the Ohio Valley being operated to its full capacity, and some of them have not made any nails for weeks. This con-



TRIMMING AND BEADING MACHINE.

\$2.50 to \$3 a ton at the works. It is the superior quality of these ores which has given to the Lehigh irons their high reputation for excellence as foundry iron. But

the fierce competition which has prevailed in the market has made it necessary to use less and less of these local ores. During the past year large quantities of Lake Superior hematites have been brought here.

## WRECK OF THE COMPTOIR.

### Its Relations with the Societe des Metaux.

The report read at the meeting of shareholders of the Comptoir d'Escompte is a curious and instructive document. Being drawn up by judicial officers, it possesses a sincerity that would have been wanting in a report by the old directors, who would have been disposed to extenuate their acts; in fact, with the exception of the names of the parties who were behind the Société des Métaux on the formation of the ring, nothing of interest has been concealed or disguised. The report is of great length, occupying over 13 closely-printed newspaper columns. The London *Economist* gives a brief outline of the history of the relations between the Comptoir and the Société des Métaux. These commenced in October, 1887, with an operation in tin, the success of which induced the latter company to undertake a similar speculation in copper on a much larger scale. To obtain the control of the market the stocks were first bought up, and it was then necessary to secure the production of the mines; but the funds of the company consisted of only £120,000 out of the capital of £1,000,000, the rest being represented by the plant, buildings and good-will of the firms purchased on the formation of the Société des Métaux and £800,000 raised by debentures. M. Denfert Rochereau, who was a member of the board, was also manager of the Comptoir d'Escompte, and it was to that establishment that M. Secrétan, director of the Société des Métaux, applied when the mines demanded a guarantee for the engagements entered into by him. The first signature given by the Comptoir d'Escompte was in December, 1887, to the Anaconda mines. This was followed by others on January 4 and March 13, but no mention of these operations was made in the minutes of the board meetings of the Comptoir.

The next step taken by M. Secrétan was to form a syndicate of capitalists, at first 16 in number, who undertook to advance a sum of £2,800,000 for a period of one to three years. The Comptoir d'Escompte was to act as banker and call for the funds as required, receiving the warrants from the mines, and holding them on behalf of the syndicate. Three members of the group, however, withdrew before February 1, 1888, when the arrangements were completed, but the place of one was taken by a new adherent. The capital of the syndicate was, however, reduced to £2,210,000, and of that sum the Société des Métaux entered for £600,000 and M. Secrétan personally for £480,000. Neither that company nor M. Secrétan furnished their share of the capital when a first call of 20 per cent. was made on the syndicate, and the £216,000 they had underwritten was provided by the Comptoir d'Escompte, and without any margin to protect the Comptoir in the event of a depreciation in the value of the copper. In March five foreign firms joined the syndicate, and the total of the advances to be made by the group was raised to £2,505,000. The Société des Métaux then increased its capital by the issue of 50,000 new shares of £20 at £30; but in the meantime the Comptoir had made a further call of 20 per cent. on the syndicate. The minutes of the board meeting of the Comptoir

d'Escompte, held on March 13, entered for the first time into details of the operations that had been apparently until then conducted exclusively by M. Secrétan and M. Denfert Rochereau. The director of the Comptoir then obtained authorization to guarantee two new contracts with mines in America, on his representations that it was a mere formality, as the Société des Métaux, with its new capital, possessed resources of its own amounting to 4,000,000 of francs. The risk, he said, would not exceed £80,000, and would be spread over a period of three years. This operation the judicial administrators refer to especially as being a violation of the Comptoir's statutes, which interdicted the management from entering into engagements for more than 90 days.

A fortnight later the Société des Métaux asked the Comptoir to guarantee contracts with the Cape Copper, Mason & Barry, Rio Tinto, Tharsis and other mines. The copper was to be delivered to the agency of the Comptoir in London, and M. Denfert Rochereau pointed out to the board that the Comptoir would be secured against loss by the engagements of the Société des Métaux and by the possession of the metal itself. The embarrassments were already commencing, for besides the copper purchases, the speculation in tin had never been liquidated, and the Comptoir was exposed to a loss of £880,000 under that head. A further call of 20 per cent. of the advances from the syndicate was made by the Comptoir, but at the same time a further fresh sum of £3,120,000 was guaranteed under a contract with the Rio Tinto Company. At the end of May the effective advances by the Comptoir amounted to £5,554,000, of which £1,124,000 were unsecured. At the end of June the Comptoir was in such straits that it had to obtain from the syndicate permission to pledge warrants it held for them, and which represented the value received for the advances made by the syndicate. Those warrants were employed to obtain advances from the Bank of France and other establishments. The syndicate which had engaged to advance the £2,480,000 to the Société des Métaux then demanded that the affairs in tin should be disjoined from those in copper, in consequence of which M. Secrétan engaged to transfer land of a value of £120,000, and the Société des Métaux acknowledged its liability for a sum of £628,000. The Comptoir agreed reluctantly to guarantee new contracts presented by the Société des Métaux, while M. Secrétan endeavored to maintain the confidence of his associates by assurances that the English founders had used up all the old copper and would be forced to submit to the conditions of the company.

At the end of July the unsecured advances of the Comptoir amounted to £2,320,000; at the end of October to £2,780,000. In December the negotiations with the object of forming an English company to take over the stock of copper had fallen through, and the Comptoir threatened in vain to refuse to make any further payments on behalf of the Société des Métaux. M. Secrétan replied that such a step would bring about an immediate collapse. At the end of December the advances amounted to £6,880,000, of which £3,480,000 were unsecured. In January the Comptoir was compelled to borrow £840,000 to continue the business of the Société des Métaux. The next sacrifice it was called on to make was to part with warrants representing a security of £1,520,000 to permit the Société des Métaux to raise a loan of £1,000,000. This was on February 5 last. In return for that concession, M. Secrétan engaged to sell from March 1 12,000 tons of copper monthly by public sales, if unable to find purchasers privately; but that arrangement was superseded by the formation of the Société Auxiliare des Métaux, which

was to take over 75,000 tons of copper at the price of £70 per ton, and pay over the value to the Comptoir d'Escompte. That contract was, however, only partially carried out, and as the Comptoir had subscribed a part of the capital of the new company, the effective reduction in the advances to the Société des Métaux was of insignificant amount.

The events that followed are well known: A sudden drop in shares of the Comptoir d'Escompte led to withdrawals of deposits, the embarrassments of the Comptoir having become a matter of public rumor; next came the suicide of M. Denfert Rochereau and the run on the bank. At the end of March the total sum advanced by the Comptoir to the Société des Métaux was £5,860,000, against which there remained 67,827 tons of copper. If this were realized at £40 per ton the loss would amount to £2,713,000. If the price realized were lower the loss would be greater. Some minor endorsements of warrants would increase the loss to above £3,200,000; consequently the entire capital of the Comptoir, which is £3,200,000, has been swallowed up. The Comptoir had further guaranteed the payment of future deliveries of 320,000 tons. The judicial administrators believe that those engagements may be canceled. The mine owners have no interest in insisting on the execution of the contracts of sale. As the report of the judicial administrators remarks, they are placed in the alternative of delivering the copper and being paid a dividend on the amount of their claims, or abandoning the contracts, in which case the guarantee of the Comptoir would become void *ipso facto*.

The Supreme Court of Florida has rendered a decision of vital importance to the public and to railroad corporations. The Board of Railroad Commissioners in 1887 fixed the rates for the Pensacola and Atlantic Railroad Company, which the company asserted were too low to enable them to earn enough revenue to pay their operating expenses, and they refused to adopt the rates fixed by the commission. The State of Florida, at the instance of the commission, brought suit against the railroad to recover the penalties provided by statute, and obtained judgments in the lower court for several thousand dollars. The railroad company appealed, and the Supreme Court now reverses the judgment of the lower court, holding that a reduction by the Legislature or commission of the rates of a railroad to a point too low to permit them to earn operating expenses is a deprivation of property without due process of law and without just compensation, and is confiscation and in conflict with the State and Federal Constitutions. This is the first decision of the kind by a court of last resort.

Forest fires of unusual magnitude for the spring months have recently swept over various sections of the country. They have been particularly destructive of property in Michigan, Wisconsin and Minnesota during the past week. Quite a number of iron-mining companies have been sufferers through the burning of timber which had been cut for use in the mines, the losses of single companies amounting in several cases to many thousands of dollars, which will seriously impair their chances for profits on the season's operations. It is not known how far the stock of cord-wood has been damaged which had been secured by the charcoal furnaces, but it has not escaped. The fall of rain has been much below the average for the season, making the forests very dry, so that it is very difficult to check fires when once started.

The Fassett prison-labor bill has gone to Governor Hill for his signature.



## THE WEEK.

The complaint of hard times in California, heard for a few weeks past, is attributed to low prices of produce and holding for an advance. Of the fruit crop, which is a feature in California agriculture, 300,000 cases are waiting shipment in consequence of high rates of freight. Viticulturists are discouraged by low prices for wine. On the other hand, the promise of extraordinary crops is very cheering. Even with lower prices for wheat and barley it is figured out that the returns will equal \$67,000,000, nearly doubling the receipts of 1888.

Chief Engineer R. L. Harris, U. S. N., one of the officers designated to test the new cruiser *Charleston*, died at San Francisco the 16th inst. of pneumonia.

The locomotive which the Pennsylvania Railroad Company imported from the shops at Crewe, England, and have been testing for the last two or three weeks, has not given satisfaction. It is in charge of an English engineer and a machinist from the shops at Crewe, and can make excellent speed with a light train, but with an average train, like the New York and Chicago limited, it is out-distanced by the Pennsylvania locomotive. When a stop is made too much time is lost in getting the English locomotive under way again. Almost its only point of superiority is the contrivance for saving fuel.

Princeton College has initiated a new course on electrical engineering.

The President's new appointments include Solomon Hirsch, of Oregon, to succeed Minister Straus at Constantinople, and John Jarrett goes as consul to Birmingham. Mr. Jarrett has been long known from his connection with the iron and steel industries. Thomas H. Sherman, Secretary Blaine's private secretary, takes the consulship at Liverpool.

In Amsterdam, the world's diamond market, the proprietors of the largest lapidaries report that America leads in buying the choicest gems.

The ubiquitous "English syndicate" that is always buying up cattle ranches, mining lands, breweries, &c., has purchased 400,000 acres of timber land, mills and other property in Florida, paying upward of \$1,500,000.

The opinion is expressed that beyond a protest from the new Chinese Minister, who will arrive in Washington about September 1, that Government will acquiesce in the practical application of the Scott Exclusion act passed by Congress.

More than 100 persons in New Haven were dangerously poisoned by eating cream from freezers which had been in disuse since last summer and were much corroded.

The scarcity of ships and continued high sales of freight operate to encourage ship-building in the Eastern States, which is receiving a new impetus.

The hardships experienced by importers of merchandise and manufacturers in the ordeal of the Custom House is the theme of a New York commercial editor, who charges that the holder of a foreign invoice is often treated as one having no rights. "Great as may be the frauds on the revenue at the hands of dishonest importers," he says, "we believe the total amount that is illegally exacted by over-estimates of value and unwarranted applications of high rates exceeds the sum that is lost through the knavery of the dealer. The public hear most exaggerated stories of the one side, but the others are compelled to a great extent to suffer in silence.

Their story is not heard, and they have no way by which their wrongs can be redressed." In all the processes of warehousing, appraising, &c., there is a strong temptation to practices that savor of extortion.

In consequence of the invention of improved machinery for the manufacture of linen thread, a company has been formed in New York which expects to compete successfully with foreign mills and to be at work in September next. The new process is known as the Boyce process, and is very simple.

The Spanish-American Commercial Union, lately organized, and which last week established headquarters in Wall street, expects to be recognized as a sort of Spanish-American Chamber of Commerce. It is the intention to establish frequent and speedy communication with South American ports and direct banking facilities between North and South America. The trade of the Spanish-American countries reaches the grand total of \$450,000,000 per annum, and of this, at present, the United States has only about 11 per cent., England and Germany dividing the remainder. The members of the union will make an effort to bring this immense foreign business to the port of New York.

New Orleans is encouraged by the recent growth of her foreign import trade, which in April was larger than for any corresponding month since the war. The returns from the West Indies and Latin America are particularly satisfactory, the imports from these countries being \$1,911,512, against \$6,072,400 for the entire year of 1887. The exports are as large as ever and the coastwise trade as good.

The site of Albany was originally called Oranje, not Aurania, as commonly believed. An investigation of the subject shows that the blunder grew out of a similarity of sound, the name given by the Dutch having been in honor of the Prince of Orange. As it sounded when pronounced by a Dutch tongue like Aurania, many inferred that this was the orthography.

The proceedings of the Samoan Conference in Berlin give promise of an amicable settlement of all differences between the three nations there represented.

The new Post-office and United States Court-house Building which has been erected in Baltimore at a cost of about \$2,000,000, will be ready for occupancy next September.

The superb new steamer, *Connecticut*, for the Providence line, will be completed at Cramp's this week, at a cost of \$625,000.

There are 6,000,000 acres in the Cherokee lands which the Government is negotiating to buy. At \$1.25 an acre this will bring the tribe \$7,500,000. The Cherokees are not rich in invested funds, though notably thrifty in their tribal and individual dealings. All the funds invested for their benefit and held for them in the Treasury—national, school and educational—amount to about \$2,500,000. The sale of the Cherokee outlet will at once increase their national wealth to \$10,000,000 and make them the wealthiest tribe in the United States.

The Canadian Pacific's new line across the State of Maine is now virtually completed, thus securing for that corporation a line extending from the Pacific to the Atlantic. The route is from Megantic, Canada, southeasterly across the State, around the foot of Moosehead Lake to a point on the Maine Central known as Mattawamkeag, about 60 miles from the New Brunswick line. From this point running rights were obtained over the Maine Central, with connections to the

Maritime Provinces. Next winter this new line will be utilized for winter business, but during this summer only a fast mail service will be established, and an effort made to open up the coal mines of Nova Scotia. New iron bridges will be built, one by the Philadelphia and Reading Railroad on the Richmond branch, and another by the Lehigh Valley near San Ringgold.

With well-directed efforts the island of Malta, according to a consular report, might become a profitable market for American-made articles, such as very light plows, hardware, including mechanical tools, especially those used in carriage-making, cheap platform scales, clocks, sewing-machines and oil stoves.

Speaking in reference to a statement which appeared in a San Francisco paper to the effect that Esquimault, British Columbia, was being made into a second Gibraltar, a Cabinet minister at Ottawa stated that such a statement was untrue. "What sensational nonsense," said the minister, laughing. "If the United States have any objection to Esquimault being fortified they can retaliate by building a fort directly opposite." The principal work in progress at Esquimault, he explained, is a gearing dock for the repair of British men-of-war.

G. E. Ruther, of Bridgeport, Conn., claims to have discovered a new system whereby a material reduction of labor in the Fire Department may be brought about. It is called the electric fire-engine, and consists of a motor, to take the place of the present steam-engine. The motors would receive their power from the dynamos of the electric lighting companies. Mr. Ruther's idea is to lay down wires from the nearest dynamos to boxes placed in close proximity to every hydrant. The instant an alarm of fire is sounded an automatic arrangement would start, the dynamos supplying the power. On the arrival of the engine at the scene of the fire a connection of the wires would be made and the pumps set to work immediately. Chief Bonner says that of the many electric substitutes for steam-power presented to him none of them, thus far, have been found both practical and trustworthy.

The Berlin Bridge Company contracted to build a bridge over the river at Sheldon, and they in turn contracted with the Vermont Construction Company to build the abutments and piers. Subsequently the bridge was carried away by high water and ice, and the Berlin Company brought suit to recover from the Vermont Construction Company, alleging defective workmanship by the latter in connection with the bridge masonry. The jury, at St. Albans, brought in a verdict on the 15th inst. for the plaintiffs in the sum of \$5875. Numerous exceptions were taken and the case will doubtless go to the Supreme Court.

In the import trade of Paraguay the United States have no share beyond contributing a few agricultural implements and a little lumber. The American consul, Mr. Hill, says respecting prospects for trade: "There is at present, as is well known, no direct line of steamers from any American port to the River Plate. All goods of American manufacture destined for Paraguay must needs be twice transshipped, once at Rio de Janeiro and again at the mouth of the Plate. Again, here, as elsewhere in South America, business is done on long credits, six months and in some cases still longer time being granted. The English and Germans are anxious to do business on these terms. My correspondence with American firms would seem to indicate that our people are not." Mr. Hill says that trade amounting to about \$4,000,000 annually is worth

the attention of Americans; that the era of progress and prosperity in that country is just dawning, and that the Government would cordially support endeavors to establish trade relations.

A syndicate of Philadelphia capitalists, headed by Mr. Thomas Cochran, is reported to have purchased the graphophone rights for the world outside of the United States and Canada. The price paid was \$500,000.

Six new street railroad lines for the city of Philadelphia have filed their articles of incorporation. A bill authorizing elevated railroads in Boston was killed in the Massachusetts Legislature.

A new railroad line into New York is contemplated by a combination of the Housatonic and New England routes. The plan comprises a water route for steamers of 36 miles from this city to Wilson's Point, near Norfolk, Conn., where they will connect with the Housatonic Railroad.

The fine steel steamer *Alaskan*, built by John Roach for the Oregon Railway and Navigation Company, foundered in a gale on the Oregon coast and many of her crew were lost. She cost \$350,000, and was one of the swiftest boats on the coast. A dispatch says her upper deck suddenly lifted and she broke in two.

Governor Ames, of Massachusetts, having recommended the removal of the old machinery in the prison of that State, a legislative committee are visiting various States in search of information which may aid in pursuing the wisest course.

The new consul to Honolulu, Henry W. Severance, was consul at San Francisco for the Hawaiian Government and is well informed respecting the affairs of the Sandwich Islands.

In the new addition to the American Museum of Natural History there will be the largest box or riveted girders ever used in the construction of a building. These girders were designed by J. Cleveland Cady, the architect, to support the floors and partitions, the object being to give unobstructed floor space. There are 28 of these girders, measuring about 62 feet in length, and weighing 40,000 pounds each. They were landed on the North River front of the city, in the neighborhood of Fiftieth street. Ordinary trucks having been taxed in vain to transport them to their destination, the contractors found it necessary to construct a tramway across the square from Ninth avenue to the building.

Mr. Wannamaker, the Postmaster-General, pays tax upon an annual business of more than \$10,000,000 and heads the list of tax-payers in Philadelphia. There are two others in that city who do a business exceeding \$5,000,000 annually.

The latest fad in boat-building is to "strike" a boat from a die, virtually in one piece of mild steel, with no rivets except where fittings have to be attached at bow and stern. The whole thing, it is said, depends upon the mildness of the steel to be employed, for in the construction there is no mechanical difficulty if only the plates will stand the bending and the force employed.

A crew of 75 men are now at work in the Hudson River tunnel, reinforced with English capital, and the excavation will soon go on from the New York extremity in the north and south tunnels alike.

A cargo of 640 tons of steel rails manufactured by the Edgar Thomson Works for the Missouri Pacific Railroad was sunk in deep water in the Mississippi River near Grand Tower two months ago. Divers in submarine armor recovered all but 90 tons.

## MANUFACTURING

### Iron and Steel.

On the 16th inst. there were shipped from the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., two large steel plates for Government ships. They were 8 inches thick, 9 inches wide and 206 inches long. Each plate weighed 13,000 pounds. The plates were bent in a semicircle, and are to be used round the pilot-houses of large gunboats. The work of bending them was done while the plates were cold—the first attempt ever made at such work in the United States. It was so successfully accomplished that the firm are getting ready to fill six more orders of a similar nature. On Saturday, the 18th inst., there were turned out at this plant two plates 96 inches wide, 180 inches long and 3 inches thick. Each plate weighed 9000 pounds. The plates were heated to a cherry-red and bent on rolls in the shape of a semicircle. They were tested to 60,000 pounds tensile strength and to an elongation of 20 per cent. in 8 inches.

The Henderson Steel and Mfg. Company, of Birmingham, Ala., have decided at a recent special meeting to increase the capital and build a 12-ton basic open-hearth furnace.

The labor disturbance at the works of the Syracuse Tube Company, Syracuse, N. Y., has been adjusted. They are now running all their mills full time in all departments.

No. 2 Furnace, of the Port Henry Furnace Company, Port Henry, N. Y., has again passed her best previous record, having made last week 498 tons of iron. This is nearly double the best average output of any previous blast, and is believed to be by far the best record of any furnace of its size in the Champlain or Hudson River Valley not using coke exclusively. Considering the fact that the ores used were all Champlain magnetites, which while rich in iron are difficult of reduction, and the fuel principally Delaware and Hudson anthracite coal, the record will perhaps compare not unfavorably with other notable furnace outputs.

Andrews Brothers & Co., of Haseton, Ohio, are adding a new and improved hot-blast stove to their furnace, which will cost about \$50,000.

There is a company in embryo to buy or lease the "old mill" and devote it to the manufacture of wire nails and sheet-iron; but nothing more substantial than talk has been done to date.—*Ironton (Ohio) Register*.

The rolling mill and nail factory of the Oxford Iron and Nail Company, at Oxford, N. J., has shut down for temporary repairs.

The American Tube and Iron Company, of Middletown, Pa., have closed a contract with the Pittsburgh Plate Glass Company, to supply immediately all the pipe necessary for their 8-inch gas line from the Ruff Run field to their Ford City Works, a distance of 12 miles. The pipe trade is in the best of conditions.

The Monongahela Furnace Company were permanently organized at McKeesport, Pa., last week. The details of the preliminary organization of the company were set forth in our issue of the 26th inst. The corporation is composed of the stockholders of the National Tube Works Company, and propose to erect two of the latest improved furnaces, each with a capacity of 250 tons daily, on the site of the White homestead at McKeesport, Pa. The pig-iron produced will be used by the National Tube Works Company and the

Republic Iron Works, Limited. Committees will be appointed at once to secure bids for the building of the new plant, which the company hope to have completed by February 1, 1890. The officers elected are: President, E. C. Converse; treasurer, W. F. Eaton, of Boston; assistant treasurer, Horace Crosby, of Pittsburgh; vice-president, D. W. Hitchcock, of Boston. Directors: E. C. Converse, J. H. Flagler, C. I. O'Connor, Horace Crosby, H. J. Eaton and D. W. Hitchcock.

The appraisement of all the real estate of the Reading Iron Works amounts to \$780,000. The estimated appraisement at the time of the failure was about \$1,000,000 more than the above amount. The appraisement of the personal property amounts to \$450,000, including some 11,000 tons of pig-iron. Deducting the mortgage and all expenses necessary for the adjustment of the affairs of the company, the sale of the iron, collecting of rent, &c., it is estimated that the balance left will be enough to pay about 38 per cent. of the claims of the creditors, which does not include the stock lien, and which may be wiped out entirely. Their figures show that the present value of the plant is considerably less than its cost and what it was estimated to be worth at the time of the assignment.

The furnace of the Bellefonte Furnace Company, at Bellefonte, Pa., has been blown out after a very successful run of 17 months. The stack will be relined, and therefore work will not be resumed for two months.

The Glendon Company, at Easton, Pa., are pushing forward repairs on stack No. 3. Their No. 2 stack, which has been in blast some time, is now out of service. This leaves but one furnace in blast.

The charcoal furnace at Joanna, Pa., has started up after an idleness of a year. The furnace has undergone extensive repairs, enlarging its capacity, and new engines and boilers have been put in.

### Machinery.

At a meeting of the directors of the Westinghouse Electric Company, held in the office of the company, at Pittsburgh, on the 16th inst., the regular quarterly dividend of 1½ per cent. was declared.

The Southwark Foundry and Machine Company, of Philadelphia, are turning out this year some very heavy work. They recently finished four immense duplex blowing engines for the new works of the Pennsylvania Steel Company, near Baltimore. Each engine weighs 755,000 pounds, and under each are two bed-plates weighing 63,000 pounds apiece. These were cast in one piece. The fly-wheel, weighing 100,000 pounds, was also cast whole and split afterward. It is believed that these are the largest blowing engines in the country.

### Hardware.

Waltham Emery Wheel Company, Waltham, Mass., report that they are running their factory night and day to fill orders. An enlargement of this plant is contemplated.

The mills of the Harrison Wire Company, at St. Louis, which have been idle for some years, were completely destroyed by fire recently, causing a loss of about \$40,000, with no insurance.

Hubbard & Co., axe and shovel manufacturers, of Pittsburgh, whose works in that city were destroyed by fire some weeks ago, have decided not to rebuild in that city, but will build new works at Beaver Falls, Pa. They already have a plant there, and will simply extend it. The firm have recently been reorganized, David M. Long, W. N. Frew and Martha E. Frew having sold their interests to the



remaining partners. The firm will continue to be known as Hubbard & Co., and is now composed of the following-named persons: Charles W. and Sherman D. Hubbard, Charles Lockhart and Samuel A. Rankin.

The Rockford Bit Company who removed from Rockford, Ill., to Kokomo, Ind., last July, advise us that the growth of their business has been remarkable in a little over a year, gaining in output from about 40,000 dozen to over 75,000 dozen annually. In order to meet the increasing demand they will make large additions to their factory, so as largely to increase their capacity, and it is expected that when finished their factory will be one of the most complete in the country. Besides the common auger bits they will make a specialty of their Perfection brand auger bits (Jennings' pattern). They allude also to the advantages possessed by them in their present location.

#### Miscellaneous.

Among the large leather belts recently manufactured by the Charles Munson Belting Company, of Pittsburgh, was one 120 feet long and 40 inches wide. It was made for the Oliver & Roberts Wire Company, Limited, of that city.

The Norton Fluid Metal Rolling Company, of Chicago, received a license to incorporate under the laws of Illinois on the 11th inst. They will have a capital of \$1,000,000, and will manufacture metal sheets, plates, tubes, &c., directly from fluid metal. The incorporators are Edwin Norton, Oliver W. Norton and C. C. Warren.

The committee appointed to examine the condition of the Malleable Iron Company, at Meriden, Conn., recommended that the creditors accept 30 cents on the dollar.

#### Labor Troubles at Pittsburgh.

During last week the workmen in the employ of the National Tube Works Company, at McKeesport, Pa., to the number of 1500, and a majority of the workmen at the Solar Iron Works of William Clark's Son & Co., at Pittsburgh, went out on a strike. In the first case mentioned the strike lasted but one day, as the firm agreed to give the men the advance in wages which they requested. It will be remembered that about one year ago the company made a reduction in wages of from 5 to 10 per cent., with the understanding that when an improvement in trade took place the reduction would be restored. It is claimed by the men that before the strike took place they made efforts through a committee to have the reduction restored and failed. The company claim that the men failed to give notice that they would strike. The latter say the demand of the committee was in itself a notice that they would come out if it was not complied with. The following statement was prepared by the general manager and handed to the committee appointed by the employees to wait on the firm:

That the management having considered your application for the restoration of the wages existing before the last 1888 reduction, now give notice that all departments will be so restored, to take effect on and after Monday, May 20.

While the business of the general pipe trade does not warrant an advance at the moment, yet we feel that if trade prices improve we have now anticipated what we expected doing at a later date.

The threading and shipping departments will resume operations to-night, Friday, May 17. The furnace and other departments will resume Monday morning, May 20, usual time.

NATIONAL TUBE WORKS COMPANY.  
J. H. FLAGLER, General Manager.

The advance in wages granted will average about 7½ per cent. All departments of the plant are now in full operation.

At the Solar Iron Works all the workmen, with the exception of the puddlers, went out on a strike on the morning of the 16th inst., and at this writing have not returned to work. As is probably well known, this is a non-union mill, and has been operated as such since December, 1887. At that time there was an extensive strike at the mill on account of the refusal of the firm to discharge a man who held two positions, which is against the rules of the Amalgamated Association. It is known as the "two-job" system. A long strike took place, which resulted in the defeat of the Amalgamated Association. For some time past the men have been dissatisfied, as they claimed they were receiving considerably less wages than are paid in mills controlled by the Amalgamated Association. On Wednesday evening, the 15th inst., the men held a meeting, at which President Weihe, of the Amalgamated Association, was present, and decided to again join the Amalgamated Association. A copy of the Amalgamated scale was prepared and presented to Mr. Clark, of the firm, who refused to sign it, the men stopping work at once. The only part of the mill in operation is the puddling department, which is operated wholly by colored men, to the number of 89. It is stated that these men would have also gone out but for the fact that the rules of the Amalgamated Association prohibit a colored man from joining it. It is stated that the firm have sent to the South for colored workmen, and will endeavor to operate the mill with new men. From present indications the fight will be a prolonged one.

The strike at the works of the Allegheny Bessemer Steel Company, at Duquesne, Pa., mention of which has been made in these columns before, is almost at an end, the workmen being defeated. While the entire plant is not in operation as yet, new men are being received every day, and it is a question of only a short time until enough men will be at work to operate the works to their full capacity.

The Lake Superior iron mines are busy. A dispatch from Ishpeming, 19th inst., says: "Over 750,000 tons of ore have already been sent from the five shipping ports of the Lake Superior iron district. At the corresponding date last year scarcely 100,000 tons of the ore had been sent forward. Marquette promises to regain the standing it once had as a shipping port for ore this season. The Cleveland Iron Mining Company, who grew tired of the extortionate charges of the vesselmen for transporting ore to Cleveland, have built vessels which will carry the entire ore output of the company this season. The vessels are of the largest size that will pass through the locks of the Sault Ship Canal, and will carry from 2500 to 3000 tons of ore. The prediction made several weeks ago that fully 6,000,000 tons of ore would be shipped by the mines of the district this year will be verified, unless appearances are deceptive. All of the large mines are preparing for heavy shipments, and the ore is going forward more rapidly than ever before. A number of the mines that ranked among the small producers last year will this season come to the front as heavy shippers. The Gogebic range will not materially add to its output of last year, but the mines of the Vermilion, Menominee, and Marquette ranges will produce more ore than ever before."

The New York Legislature, now adjourned, made appropriations amounting to about \$12,560,000, against \$9,089,000 last year, an increase of more than one-third. The rate of taxation for State purposes is raised from 2.62 to 3.52 mills on the dollar. Mayor Grant's Rapid Transit bill was killed; also the bill to reduce telephone charges. The Fasset Prison

bill was passed. Judge Greene's bill for bridging the North River was killed. The most important bill passed as concerning New York City was the \$4,000,000 Municipal Building bill.

#### Another Atlantic Racer.

The new Hamburg liner, Augusta-Victoria, the first of the twin-screw steamers built in England for the Hamburg-American Packet Company, arrived at this port on Saturday evening, completing the best first trip ever made by an ocean steamer. The exact time taken in going from Southampton to Sandy Hook was 7 days 2 hours and 30 minutes, equal to 6 days 8 hours and 30 minutes from Fastnet. She has a length of 460 feet, a width of 56 feet and a depth of 38 feet. Her engines develop the force of 12,500 horse-power, and her displacement is 10,000 tons. She carries three masts, and has a sharp straight stem and well-rounded stern. The new vessel has its whole working machinery duplicated. There are two distinct sets of boilers, two engines, two shafts and two screws, both sets working independent of each other, and separated by one solid longitudinal bulkhead running through the whole length of the ship from stem to stern, from the keel to the upper deck, and dividing the vessel into two non-communicating halves, of which each is fully equipped to propel the ship. It is claimed that in case of accident to one side of the vessel the other portion could in no wise be affected, as the machinery of the opposite half would continue to work and propel the ship with perfect ease. Numerous water-tight compartments subdivide each side of the ship and do not communicate with each other. These dividing bulkheads are solid fixtures without any openings whatever, and are thus capable of confining to one compartment any accident that might happen, for in case of a leak the compartment might be filled with water without affecting the buoyancy of the ship, and in case of fire such compartment could be quickly flooded with the steam pumps. The steamer has two keels, one on each side, which have not only the effect of lessening the draft but also prevent to a great extent the rolling motion, thus tending to keep the screws always under water and increasing the speed.

The collapse of the Panama Canal scheme is complete, the last contractor having ceased on the 7th inst. The most impressive spectacle in surveying the grounds is the immense quantity of abandoned machinery in various stages of corrosion. Merchants are vacating their warehouses.

The City of Paris, of the Inman Line, arrived at Queenstown on Tuesday night, having made the fastest eastward passage on record. The journey lasted 5 days, 22 hours and 10 minutes. By this feat the Inman liner has outdone her own westward achievement. The last trip of the City of Paris from Queenstown to New York was made in 5 days, 23 hours and 8 minutes.

Berlin dispatches indicate that Germany has agreed to restore King Malietoa to the Samoan throne, but demands an indemnity for what are termed native aggressions against the Germans.

It is reported that a company with a capital stock of \$3,000,000, made up of English capitalists and northern iron-masters, will build four blast furnaces at Cumberland Gap, Tenn., near the Virginia line.

# The Iron Age

New York, Thursday, May 23, 1889.

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GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## Profits of Iron and Steel Manufacturers.

Under existing circumstances it is very natural for business men to draw comparisons between their own unsatisfactory condition and that of those with whom they have trade relations. Although everybody concerned may be suffering from unremunerative prices for their products, as well as a restricted demand, the other man is always the one who is specially favored. Manufacturing consumers of iron and steel seem to be particularly inclined to entertain this view with regard to those from whom they draw their supplies of what to them is raw material. No matter how low prices of such iron and steel may be the consumers insist on having them reduced still lower, in the belief, which is more or less popular, that somehow or other the iron and steel manufacturer will be able to retain for himself a comfortable margin of profit. The competition for business between the manufacturers is by no means relied upon to depress prices to consumers, but the latter resort to all kinds of practices and devices to get their iron and steel cheaper. They ignore statements which may be made of the impossibility of further reducing prices so long as good raw materials and wages continue on the present basis, and take the chances of receiving a product cheapened by the use of inferior materials or poor workmanship, the necessity of which is thus imposed on the manufacturers. Yet the iron and steel business is regarded as such a desirable and lucrative occupation that outsiders are continually seeking to enter it.

Those who have had a long experience in the manufacture of iron and steel, and who should be able to express a correct opinion of its advantages and disadvantages, invariably assert that consumers have in the majority of cases acquired wealth more rapidly than themselves. The years in which a fair margin of profit is secured by a manufacturer are very few in comparison with the years in which prices are low and margins are narrow or else wiped out altogether. There are conspicuous instances of large fortunes made in this branch of trade, but they are the more conspicuous by reason of the numerous instances to be found in every iron-making section of works which have only earned their owners a fair competence, or have barely given them a living or have proved absolute failures, and ruined all connected with them. There is not an iron-making section of the country in which disastrous failures, often occurring despite the most careful management, have not served as reminders of epochs of low prices and unremunerative business. They should have served a useful purpose also as monitors to those who affect to believe that iron

and steel prices can be indefinitely reduced without disaster to the producers.

A manufacturer of not less than 25 years' experience, who has been reasonably frugal and who has acquired but a modest competence to represent that long term of hard work and risk of capital, recently sought to make a sale of iron to a consumer who in less than half that time had swollen his capital of \$25,000 to over \$2,000,000. He was not told that his prices were higher than those made by competitors, but that all prices of iron were still too high and would have to be reduced; iron manufacturers in this country were making entirely too much money and must cut down their profits. If they refused to do so willingly they would be obliged to do so against their wills. The immense fortune which had been accumulated by the consumer in question was evidence in itself that so far as the price of his own products was concerned he had taken good care to see that it was high enough. The view of the iron trade taken by this man is not exceptional, or it would not be worth stating. On the contrary, there are many consumers who express themselves in the same way, and, further than that, they endeavor to depress prices by various means, in order to force values down to the level which they insist should obtain.

It would be invidious to point out the memorable failures in the iron and steel trades which have occurred to add emphasis to this presentation of the manufacturers' side. Examples will occur to the least informed. Those who have made large fortunes out of the iron and steel business in itself are comparatively few in number, taking into consideration the vast extent of the business and the large number of persons interested in it. Side issues, such as land speculations, coal mining, oil speculations, and above all ore mining, have caused accretions of wealth which have often been wrongly attributed to the large profit on the manufacture of iron and steel because the party involved was known to the world generally as an iron and steel manufacturer. We have in mind as an instance of this a good friend who frankly confesses that until he became actively interested in ore mines he was able to accumulate very little money, although he had previously for years conducted what outsiders presumed was a very lucrative iron and steel business. His customers were more benefited than he was, and this, we believe, would be the testimony of most manufacturers.

## Arbitration at the Conference of American Nations.

With few exceptions, all the Governments of nations to the south of us have now officially accepted the invitation of our Government to attend the congress of all American nations to be held at Washington in October next. Among the items in Section II of the programme there are two likely to lead to practical results of far-reaching influence. They are:

1. Measures that shall tend to preserve the peace and promote the prosperity of the several American States.

7. An agreement upon and recommendation for adoption to their respective Governments of a definite plan of arbitration of all questions, disputes and differences that may now or here-

after exist between them, to the end that all difficulties and disputes between such nations may be peacefully settled and wars prevented.

Several wars in Central and South America that occurred during the present generation could easily have been avoided if arbitration had been resorted to. We may instance the war on the Pacific, which ruined Peru almost hopelessly and debarred Bolivia from access to the Pacific, and the war in Central America that followed the invasion of Salvador by General Barrios, then President of Guatemala. War seemed inevitable (at the time of the strife on the Pacific) between the Argentine Republic and Chili on account of the Patagonia frontier. President Hayes' arbitration prevented it, and only last year President Cleveland arbitrated between Nicaragua and Costa Rica in connection with the projected canal. In a few instances European monarchs have lately been arbiters, Spain in particular, the last decision of the latter settling the difficulty between Colombia and Italy. Most of the disputes in Spanish America being border troubles, and Spain possessing in her archives the old documents relating to frontier surveys between the former viceroyalties, she is the less objectionable among the European States, but still if European arbitration can be avoided and the nations of this hemisphere settle the differences quietly among themselves on the basis of a mutually accepted principle, it will be by far better. The sooner a standing committee of an international character can be appointed the better it will be for the settlement of pending disputes threatening war. The most urgent case for settlement seems to be the dispute between Paraguay and Bolivia. We extract from an editorial, which in April last appeared in the leading Rio daily paper, the *Jornal do Comercio*, the following passage: "It is asserted that the Brazilian Government can do nothing to prevent a conflict between Bolivia and Paragua, since our Government has suffered a check from the first nation which will seize the territory in dispute. It is also evident that a treaty of alliance exists between Brazil and Paragua, which, while strengthening the Republic, guarantees the interests of Brazil. There is no doubt that we are preparing for war, since everything indicates that it is imminent. Under the pretext of preventing an invasion of our territory, we send to our frontiers an army five times larger than is necessary."

In answer to insinuations of the kind, the Government of Dom Pedro kept silent. Early in March news was still peaceful; it was then asserted that this question of the Puerto Pacheco district on the upper Paraguay was receiving an amicable settlement. Paraguay was to reserve her sovereignty, while conceding to Bolivians the usufruct of the district. A hitch seems to have occurred since, and Brazil prepares for active military intervention, which may suit its home politics all the better, since the republican agitation would then find a diversion and be suffocated by the martial ardor.

The trouble between England and Venezuela about the British Guiana frontier was alluded to by President Pablo Rojas Paul in his message to the National Congress, assembled at Caracas, in March last, with the following words: "The English have from all appearances definitely

taken possession of the vast territory which stretches from the Essequibo to the Pomaron on the southern bank of the Orinoco, building fortifications, erecting buildings for offices, and organizing colonial administration, the inference being that they regard as their property that portion of the neighbor's house." Prior to the more important gold discoveries in the district the ownership of Venezuela was recognized and permission was asked to build light-houses at the mouth of the river for the benefit of the seafaring nations; it was stated that the garrisoning of Point Barima, situate in a region explored by the English traveler, Schomburgk, did by no means imply that England laid claim to it. The importance of the gold mines, which appears to be permanent, has changed all this.

The partisan strife in Hayti since the exile and death of ex-President Salomon, last summer, does not appear to draw to a close. One month Légitime is the victor, and the next Hyppolite. It is asserted by foreigners arriving thence that both intentionally prolong the strife so as to be able to drain the country of what money there is left till both have enough. Under Salomon Hayti flourished, coffee (about the only product besides logwood) brought good prices latterly, so that it may take some time before the cash that can be extorted is exhausted. As we are the only nation which has not recognized Légitime, nor his blockade, we are doing a thriving trade down there. But the warfare is described as being most barbarous, and it is about time that some pressure be exercised to put a stop to the atrocities mutually perpetrated. The rest of America is in a normal condition, there being no revolution present or in sight. But the three cases we have alluded to amply prove how necessary it has become for the interests of all to firmly establish arbitration. As late as December 4 last Don Matias Romero, Minister of Mexico at Washington, in a letter to the Philadelphia Peace League, dwelt at some length on the good prospects which arbitration evidently has in America, showing how useful it has been between his country and the United States. This seems indeed to be the general sentiment.

#### The Copper Situation.

The American mines fixed the price of copper last week at 12 cents for Lake, which represents the price on the basis of which they are willing to pay rebates of  $4\frac{1}{2}$  cents on copper delivered during the past two months. It represents the price, too, which they hope to maintain, providing the negotiations with the bankers who hold the stock of syndicate copper are carried to a successful issue. It is reported that new propositions have been again submitted. It is certain that the foreign holders will be very eager to participate in the highest market of the world. It may be questioned whether they can realize say £47 for Lake in Europe, which would be equal to about  $10\frac{1}{2}$  cents here. On the other hand, the American mines cannot hope to hold the price at 12 cents if the stock of the foreign bankers cannot be tied up in some way, or entirely taken out of the country, as has been proposed. If the negotiations fail the foreign

bankers will certainly be eager to sell here so long as they can get any more in the American market than they can hope to secure abroad. Only artificial means can hold the market at 12 cents or anywhere near it, and whatever agreement is reached must include the holders of the stock held here on foreign account. It is not surprising that under these circumstances manufacturers and the trade will operate very carefully, and even if finally the completion of the pending negotiations should be announced, there are too many possibilities of leaks and evasions to inspire very much confidence.

The leading considerations which command caution have been repeatedly alluded to. In the first place, our mines are able to supply the market fully, at a small profit, at 10 cents a pound, and then must find an outlet for a surplus abroad. The price at which the latter can be placed must ultimately determine approximately the figure at which the domestic consumers are supplied. The surplus is too great, it comes from too many sources, too readily antagonistic, to allow of the old methods of marketing at a sacrifice for the sake of holding up this market artificially. The price in the United States cannot long be 25 per cent. higher than that for the same grades of metal in Europe. But even if producers all over the world can get together to agree upon a reduction of output, the bankers must be dealt with. It has certainly not proved an easy matter thus far, after months of negotiations in the face of serious dangers.

A good many persons in the copper trade seem inclined to the opinion that its best interests require the maintenance of a price like that just made. But the evil is done. The penalties of the unnatural condition of affairs last year must be borne. It may well be questioned whether all interests are not best served by a complete break with the past, allowing consumption to develop as it should under the stimulus of prices which have become natural.

**Reduced Rates on Iron.**—The Pittsburgh and Lake Erie, Pennsylvania, and Pittsburgh Western railroads have reduced the freight rates on pig-iron, blooms, scrap, muck-bar, &c., to and from the Mahoning and Shenango Valley blast furnaces 15 cents per ton. The former rate was 80 cents. It is now 65 cents. This reduction is in effect between Cleveland and the valleys as well as between Pittsburgh and those points. The depressed condition of the iron trade caused the railroad companies to make the reduction. The rates on the Baltimore and Ohio and Pittsburgh, McKeesport and Youghiogheny between the Connellsville district blast-furnaces and Pittsburgh have been correspondingly reduced. A similar cut has been made on the first-named road between Pittsburgh and Cleveland.

The Treasury Department has designated Barren Island, in the New York collection district, as a place where vessels laden with coal, salt, railroad iron, or other like articles in bulk, may after entry at the Custom-House discharge their cargoes under the superintendence of customs officers at the expense of the persons interested.

The Madrid Government is at work on the Cuban tariff, and it is promised that some of the enormous duties will be moderated.

#### PERSONAL.

George H. Hull, president of the American Pig Iron Storage Warrant Company, is in the South.

Abram S. Hewitt, of Cooper, Hewitt & Co., New York and Trenton, spoke at the meeting of the Iron and Steel Institute to re-enforce the invitation of the American Institute of Mining Engineers and other American societies to hold a meeting in the United States in the fall of 1889.

John Jarrett, the well-known labor leader, for some years president of the Amalgamated Association, has been appointed consul to Birmingham, England. The position is an important one, and one to which it is believed Mr. Jarrett is well fitted from his intimate knowledge of the iron and steel business, which will be of considerable advantage to him in fixing valuations and superintending invoices, part of the duties of the consul. At present Mr. Jarrett is secretary of the American Tinned Plate Association, with headquarters in the Lewis Block, at Pittsburgh. Upon his departure for England his duties will be assumed by James M. Swank, the well-known general manager of the American Iron and Steel Association, of Philadelphia.

E. H. Utley, for a number of years general freight agent of the Allegheny Valley Railroad, at Pittsburgh, has resigned to enter the employ of Carnegie, Phipps & Co., Limited, of that city. He will take charge of the freight business of that firm, and also of Carnegie Bros. & Co., Limited.

F. E. Bachman has resigned his position as manager of the Tennessee Coal, Iron and Railroad Company's furnaces at Ensley, Ala., on account of his health. His address is now Strasburg, Lancaster County, Pa.

M. D. Flynn, a prominent iron-worker of Youngstown, Ohio, is mentioned as the probable successor of William Martin, the present secretary of the Amalgamated Association, at Pittsburgh, who will shortly resign his position to accept an appointment under the Government.

John Birkinbine, of Philadelphia, has gone to Duluth, Minn., where he is superintending the construction of a new furnace. He will be absent for about two weeks.

Adolf Sutro, of tunnel fame, proposes to erect a large library building in San Francisco.

Henry A. Bentley, of Newport, a civil engineer of note, went on board a boat of the Fall River Line and his body was picked up in the Sound five days later.

W. E. Dodge, of New York, has sailed for Europe.

Among those who passed over the Central New England and Western Railroad, a connection of the Poughkeepsie Bridge, were the following, who are well known as being identified with large iron interests in Eastern Pennsylvania: Arthur Brock, John W. Brock, Henry McCormick and Charlemagne Tower, Jr., of Philadelphia.

The American Institute of Electrical Engineers have just elected the following officers: President, Prof. Elihu Thompson; vice-presidents, Francis R. Upton, T. Commerford Martin, Edward Weston, Prof. Edward L. Nichols, Dr. Louis Duncan; secretary, Ralph W. Pope; treasurer, George M. Phelps; managers, Dr. Schuyler S. Wheeler, George B. Prescott, Jr., Joseph Wetzler, Thomas D. Lockwood, Francis B. Crocker, William Mayer, Jr., John W. Howell, Charles Cuttriss, Dr. F. Benedict Herzog, Henry Van Hoevenbergh, H. C. Townsend, Prof. W. E. Geger.

## THE MECHANICAL ENGINEERS.

### THE ERIE MEETING.—II.

On Wednesday afternoon a visit was made to the Erie City Iron Works, manufacturers of steam-engines, boilers and circular saw-mills. The works, which already cover a large area, are being considerably extended. The visitors were much interested in a new form of engine which is to be placed on the market. In plan it is T-shape, the cross-bar representing the cylinder and the stem the shaft. The shaft is placed at right angles to the cylinder, from the center of one side of which it projects, that side of the cylinder next to the shaft being cut away sufficiently to permit the revolution of the crank. Projecting at right angles from the center of the piston, to which it is rigidly attached, is an arm engaging by universal joint with the crank on the end of the shaft. The piston acts as a valve, opening and closing the inlet and exhaust ports, which are placed near the center of the cylinder, core passages leading to each end. As the cylinder moves forward from one end to the other it travels on a spiral, the latter half of which is, of course, the reverse of the first half. The engine shown ran at high speed, and was free from all undue jar. We hope shortly to present engravings showing in detail the construction and operation of this new form of engine.

After passing through the machine-shop, foundry and boiler works, the members were led to the establishment of the Stearns Mfg. Company, a large and well-appointed collection of buildings devoted to the manufacture of engines, boilers, edgers and sawmill machinery. The main machine-shop is 300 feet in length by 80 feet in width, being two stories at the sides, the center portion being occupied by a traveling crane moving the whole length of the shop. Here was shown a partly-assembled Wilkin's gang saw, in which the heavy reciprocating parts were so nicely balanced as to do away with the hurtful pound so common and destructive in these machines at each change of stroke. After making a tour of the works the members were led to the drafting-room, where they were shown the beauties of red fluid adapted for printing in blue, after which they were photographed in a group.

From the Stearns works the visitors passed to the Jarecki Mfg. Company, makers of gas, steam and water fittings of all kinds. Here a most interesting collection of automatic machinery designed especially for the work to be done was found. One machine was found tapping T's up to 10 inches, the six threads of two T's being tapped at the same time. The wheel carrying the T's is hexagonal in section, the T's being held in chucks, one to each face. Two sets of taps of three each were so arranged as to feed toward the T's, tapping the ends of the arms and the stems at the same time. After the thread had been cut the machine reversed and withdrew the taps at a quicker speed than they were at first fed. After tapping the two T's, the wheel was revolved one-third of a revolution to bring two other chucks in position before the taps. A small pump forced oil on the taps as they were fed forward. Machines constructed on the same principle are also adapted for threading angles and straight connections, either right or left. In the cock-boring machine 12 cocks are bored simultaneously. The cocks are held in 12 chucks, arranged on a circular center mounted rigidly on a shaft extending through the center of the machine. These chucks are carried by short revolving shafts placed at such an angle with respect to the axis of the machine that the tools will cut the required taper. The inner end of each chuck-shaft is provided

with a pinion engaging with a stationary gear, the arrangement being similar to an epicycloidal wheel. It is apparent that as the shaft revolves it carries with it the 12 chucks and the cocks held by them, this revolution, by means of the pinions and gear, revolving the chucks. The cutting tools are carried upon a second wheel, splined to the shaft, and so fixed that each tool comes opposite the cock it is intended to bore. The tool-carrying wheel is fed forward by suitable arrangements in the rear of the machine. There was also shown a small and very accurate machine for turning the balls for valves. In the machine-shop near one of the lathes reserved for heavy work was a pneumatic hoist, consisting of an air cylinder and a piston, to the piston-rod of which the hook was attached. This traveled on a track leading from the door over the lathe. The work to be done in the lathe was lifted by means of compressed air admitted under the piston. The device was found to work most admirably.

"Standards" was the title of a paper presented by James W. See, which was held over for the evening session. The following is an abstract of it: "The watch-maker of old was really a watch-maker because he made a watch. He made the works and every part of the works. He made the case and every part of the case. He made the watch as a thing by itself, without regard to any other watch which he might have made in the past, or might be making at present, or might make in the future, and above all, without regard to any watch which any one else might make. His work was well done, or at least we of to-day must say so. . . . When the old watch-maker made his next watch, it also stood upon its own bottom. It was as good as the first one and probably a trifle better, or perhaps worse. It was bound to be different, for the simple reason that in those times no thought had been given to processes for duplicating good things." To-day, looking at the old watch-maker, we would criticize his screws because they would not interchange with each other, and this difficulty would be met by the fact that each screw was marked to correspond with its hole. In those days the screws and other important details of the watch were designed especially to differ from each other, the idea being that repair to be done should be done by the maker. This business theory has long since been exploded, and the watch-maker of to-day understands that if his watch can be readily repaired he will have an advantage in sales. He will not use a screw which cannot be readily produced by another watch-maker called on to repair his watch. It follows that many watch manufacturers will be making the same kind of screws, and then a screw manufacturer appears who can make all the screws cheaper than either can make the part he needs. "The effect of the modern system of product details has been to demand that there should be a uniformity of details—that is, an interchangeability among the individuals of the same class. To secure a reliable uniformity of excellence in the general character of the purchased details of mechanical structures constitutes one of the continued strains upon the manufacturer, and it may be said as a general fact that standards of uniformity have been most thoroughly established in those branches of trades in which the fewest numbers of parties are interested."

The writer then pointed out a few examples in which the desirability of establishing standards is apparent. We give the list in part, without the comments: Steam and gas pipe; cast-iron water and gas pipe; brass tubing; boiler tubes; lead pipes; hose and hose couplings; circular saws and their arbors; bolt threads; machine screws; bolt heads and nuts; gauge

of railroads (there is no standard of record; although the necessities of transportation have brought about an accepted standard expressed as 4 feet 8½ inches, there is no record of it); street-car gauge; gauge of common vehicles; shanks of oil cups, cocks, &c.; nails, braces and bits; drill shanks; tool sockets, tool eyes and their handles generally; machine-tool posts; bolting-slots for machine tools; noses of lathe spindles; sections of rolled iron; hinges; locks; oil-well tools; stove-pipe; pinion wire; washers; brick; tin-plate; wire cloth; rivets; rope and wire rope; files; wire; brass; babbitt metal; pig-iron, steel and the metals generally; steam-engines; tests of machinery.

In the proposed method for the record of standards there shall be a governmental bureau of standards, in which any respectable representation of a trade or craft, after adopting a standard, may file the same. The use of such standards is not to be made compulsory. It is proposed that after a standard has been established a description of it can be procured on payment of reasonable fees. A governmental publication of an established standard is proposed. The bureau of standards could be satisfied by a single additional division and examiner in the Patent Office. An enactment would be required creating the bureau, providing for the filing of a standard after its adoption by a business, trade, representative body, &c., the numbering of the standard and the use of a symbol indicating that the article conforms to the United States standard No. —. The paper closed with suggestions regarding the best method of promoting the proposed system of standards.

The discussion on this paper brought up the fact that the list presented by Mr. See failed in many respects to cover the ground as regards manufactured articles for which there are now no standard sizes recognized by manufacturers in general. This includes taps, reamers, bolts, nuts, set-screws, washers, cut gearing, dowel pins, wing nuts, &c. Oberlin Smith, in a written communication, advised that no society or body should be allowed to file standards indiscriminately. He advocated the appointment of a United States commission of representative men to examine and report upon the adaptability of any proposed standard. He advised the doing away with all present gauges, and the adopting of a new one with numbers in parts of a thousand. A committee, consisting of J. W. See, Coleman Sellers and Oberlin Smith, was appointed to obtain further information.

In the paper by Professor Webb on "An Error in the Encyclopædia Britannica," it was shown that, in the article on hydro-mechanics, the horizontal force or reaction, acting on the side of the vessel opposite the orifice through which the water flowed, was constant and independent of any movement of the vessel. This deduction is contrary to that presented in the article, which gives two formulae for the reaction—one when the vessel is at rest and the other when it is moving in a direction opposite to that of the jet. The paper brought a written reply from Professor Unwin, the writer of the article, in which the inaccuracy is practically acknowledged. From "Note on the Steam Turbine," by Professor Webb, we take the following: "When steam flows out from under a considerable pressure it attains a very high velocity. In the production of this velocity the steam expands from the high to the low pressure, and the mechanical energy thus produced, and existing in the form of kinetic energy in the moving steam, would seem to be obtained with a high degree of economy. The problem, therefore, is to some extent the same as in a water turbine, having given a stream of fluid at a certain velocity, to abstract as much as possible of the energy from it by allowing



it to react upon a moving wheel. Now, the primary condition of economy is that the fluid shall leave the wheel with only enough velocity left in it to get it out of the way; and in the case of the steam turbine this requires an almost, if not quite, impracticable velocity for anything like a great difference of pressure." Professor Webb described a unique form of steam motor which was really composed of a large number of turbine-wheels, which increased in size from the live-steam entrance to the exhaust. The wheels were mounted on a common shaft and were separated from each other by spaces about the thickness of the wheels. The steam as it passes from one space to another impinges on the blades of the wheels, which are driven with great velocity. This steam turbine is used on the steamship City of Berlin to drive a dynamo, its shaft being united to the armature shaft. As the steam at its entrance into the turbine has a pressure of 150 pounds and at the exhaust a pressure of only 15 pounds, the efficiency and economy of the wheel are made evident.

Mr. Swasey stated that he had examined and in fact made the driving-gear for a similar steam turbine which used steam expansively, and which, by actual count, had attained a speed of 25,000 revolutions a minute.

"Notes on the Comparative Loss by Friction in a Transmitting Dynamometer Under Different Loads and Speeds," by Samuel Webber, showed that the friction remained constant under a very considerable increase of load and varied slightly with the velocity. The table accompanying the paper shows not only the constancy of the friction in the dynamometer, but also the consequent decrease of the coefficient of friction.

The paper by Profs. J. E. Denton and D. S. Jacobus on "Steam Consumption of Engines at Various Feeds" was the record of experiments made with a 17 x 30 steam engine driving one of the air compressors used in the construction of the new Croton aqueduct. It was found that there was a distinct gain in economy of steam as the speed increased for one-half, one-eighth, and one-fourth cut-off at 90 pounds pressure; that the loss in economy for about one-fourth cut-off was at the rate of  $\frac{1}{2}$  pound of water per horse-power for each decrease of revolution per minute from 86 to 26 revolutions, and at the rate of  $\frac{1}{4}$  pound of water below 26 revolutions. Also at all speeds the one-fourth cut-off is more economical than either the one-half or one-eighth cut-off. One-half cut-off should be less economical than one-fourth cut-off for 90 pounds boiler pressure, without any consideration of cylinder condensation. One-eighth cut-off, however, should, by the theory of expansion, be more economical than one-fourth cut-off, so that the fact that such is not the case is ascribable only to cylinder condensation. A boiler pressure of 90 pounds was shown to be superior in economy to 60 and 80 pounds at ordinary speeds and cut-offs, the superior economy of the higher pressures not being due to differences of cylinder condensation. The actual minimum water consumption of the engine was found to be at one-fourth cut-off. For 90 pounds boiler pressure the consumption was 27.5 pounds at 60 revolutions and 26.5 at 90 revolutions. "Evidently steam throttled from 90 pounds to an extent which would afford 23.45 pounds mean effective pressure would give somewhere about 5 per cent. as the steam unaccounted for or condensed by cylinder condensation, and the difference between this value and 15 per cent. for Test 45 is fairly attributable to the superheating due to the throttling, and there is a consequent saving in steam consumption per horse-power between the average for 34 and 35 and for 45, equal to

56.87 - 47.8 = 9 pounds, or about 16 per cent. This represents the advantage of obtaining a given horse-power at a fixed cut-off by carrying a high boiler pressure and throttling to a low initial pressure, rather than using a boiler pressure very little above the desired initial cylinder pressure. But if we seek the water consumption for a case where practically the same mean effective pressure is obtained with ordinary ranges of expansion, we find that any such saving due to superheating by throttling as is indicated above is quite incapable of competing with the saving involved in the use of the principle of expansion. Thus we have in Test 38 for 60 pounds boiler pressure and about three-tenths cut-off a mean effective pressure of 27.4 pounds and a water consumption of only 31.6 pounds, or a saving of one-third of the throttling consumption just quoted. Again, in Test 30 for 90 pounds boiler pressure and about one-eighth cut-off we have 22.7 pounds mean effective pressure, and a water consumption of 29.5 pounds per horse-power, or nearly a saving of 40 per cent. of the throttling consumption." Regarding cylinder condensation the writers stated that it was impossible to analyze, in time for the present meeting, the data regarding liquefaction of steam by cylinder condensation, with a view to determine any even approximate law underlying the quantities of steam liquefied under the various conditions covered in the investigation.

In the discussion of this paper Professor Wood stated that in an engine in which the steam was throttled from 90 to 45 or 50 pounds pressure there was a great saving when the boiler pressure was reduced to 50 pounds, and the engine was run with the throttle wide open.

The paper by Professor Denton on the "Performance of a 35-ton Refrigerating Machine of the Ammonia Absorption Type" was founded on tests made of a machine in operation at an establishment where it is used to maintain about 400,000 cubic feet of space at an average temperature of 34° F. It was found "that the total refrigerating effect of the machine during 24 hours was equivalent to the cooling of the circulating brine an amount equal to the heat which would melt 40.67 tons of ice to water at 32° F., or freeze 40.67 tons of water at 32° F. into ice. This work is what is to be understood as '40.67 tons of ice-melting capacity,' and also 'that if each pound of fuel consumed at the boilers evaporated 10 pounds of water into steam at 45 pounds pressure above the atmosphere, then each pound of fuel consumed in operating the refrigerating machine produced an amount of refrigerating effect equivalent to the heat which would melt 17.1 pounds of ice to water at 32° F., or freeze 17.1 pounds of water at 32° F. into ice.'" The paper fully describes and illustrates the machine, and shows how the test was conducted.

Thursday morning Prof. De Volson Wood presented four papers, headed "The Expansion of Timber Due to Absorption of Water," "Some Properties of Ammonia," "Formulas for Saturated and Superheated Vapors," and "Some Properties of Vapor and Vapor Engines." He found by experiments that the elongation in the direction of the grain and the lateral expansion were as follows:

	Pine.	Oak.	Chest-nut.
Elongation, per cent. ....	0.065	0.085	0.165
Lateral expansion, per cent. ...	2.6	3.5	3.65

The tests were made with specimens 36 inches long,  $\frac{1}{4}$  inch thick, and 5 inches wide. The specimens were thoroughly dried and then soaked in water, the two measurements taken giving the elongation and expansion. The paper on ammonia contained important data concerning its properties, and is of value now, as ammonia is used so extensively, especially for refriger-

ating purposes. The paper was prepared as a preliminary step to further investigation. The other two papers gave valuable formulas on saturated and superheated steam. In the discussion Professor Denton presented a table in which the efficiency of the vapors steam, ammonia, ether, sulphide of carbon and air, expanded from 100 pounds to 14.7 pounds, was shown.

We will in an early issue present an illustrated abstract of the paper by A. F. Nagle on the "Cornish or Double-Beat Pump-Valves," and also of the one by A. W. Jacobi, on "Improved Motion Device for Engine Indicators."

A paper on the "Distribution of Steam in the Strong Locomotive," read by F. W. Dean, was supplementary to one read a year ago. The average consumption of steam was shown by diagrams to be as follows:

	Pounds.
Engine No. 383.....	22.34
Engine No. 444.....	25.67
Engine No. 357.....	26.73

After cast-iron valves had been substituted for the steel valves, which were wearing badly and leaking, the average result was for engine 444, 21.95 pounds. The initial pressure in the cylinder of the Strong engine is only some 3 pounds below the boiler pressure.

In the discussion that followed, W. W. Sprague, general foreman of the C. R. I. and P. Railway shops, stated that those engineers who ran with the throttle wide open and regulated with the lever used less coal than those who throttled the steam. In answer to a question if this was not hard on the valve and gear, Mr. Sprague said that the valves were of the balanced type and no undue wear was found to take place.

J. M. Whitham read a paper on "Cylinder Ratios of Triple-Expansion Engines," in which he presented a method of finding these ratios, giving the necessary formula and diagrams, and in which he presented a most valuable table giving the cylinder dimensions and ratios, piston stroke, the boiler-pressure and the piston speed, and the indicator horse-power of many of the best-known triple-expansion engines which have been built during recent years.

Thursday afternoon the members visited the Ball Engine Company's Works, and examined the machinery and methods there in vogue. All the engines made by this company are, before being sent out, tested under steam, and indicator diagrams taken. We expect soon to publish engravings showing the construction of the Ball compound engine, which has only recently been placed on the market. The party were then initiated into the mysteries of paper-making at the extensive Watson mills, after which they inspected the steam-engine and boiler works of T. M. Nagle and Cleveland & Hardwicke.

Thursday evening the members attended a reception at the Reed House, "tendered by the resident members and their friends to the visiting members and their ladies."

At the final session of Friday morning, Scott A. Smith considered the question of "Belt Traction on Pulley Faces." The most intimate contact of a belt with a pulley comes, first, in the smoothness of the pulley face; second, in the smoothness of the belt; third, in having the crown of the driving and receiving pulley exactly alike; fourth, in having the crown of pulleys not over  $\frac{1}{4}$  inch for a 24-inch face; fifth, in having the crown two planes meeting at the center, and finally to so cut the meeting ends of a belt as to bring a nearly uniform stress on the lacing. The closing paragraph is as follows: "As friction is due, largely, to the unevenness of two surfaces in contact under motion, and as the best tractive quality of belts comes from the evenness and smoothness of the two surfaces of belt and pulley face, it easily follows, from what I have said, that the

value of the tractive force of a belt on a pulley face is due, first, to atmospheric pressure; second, to the tractive adhesion of the leather fibers and the oxidized oil of the currying process."

The statement regarding the important part played by the atmosphere brought out a warm discussion. J. H. Cooper said it was necessary to distinguish between friction and adhesion, one being independent of surface and the other dependent largely upon surface. In general, pulleys should be of larger diameter, there should be less width of belt, and the leather should be more pliable to insure better contact. Perforated pulleys in which the entrained air can escape give better results than those with plain surface. Atmospheric pressure has nothing to do with the grip of the belt on the pulley. F. H. Ball said that if the holes in a pulley face performed any function it would be better to perforate the belt, as the centrifugal force would create a current aiding the displacement. The discussion showed that the air theory had two parties of exactly contrary opinions, and, further, that very little concerning the true relation between the belt and the pulley was known.

The paper by J. H. Cooper—"On the Longitudinal Riveted Joints of Steam-Boiler Shells"—gave several new and valuable formulæ for the guidance of boiler-makers in proportioning the longitudinal joints.

In the discussion that ensued C. H. Parker said that the quality of boiler-plates had not yet become so uniform that a test section could be regarded as indicating the strength of the entire sheet. Sheets produced by the same maker also vary in strength. In hot fire seams are raised in temperature, and the tensile strength thereby reduced. Scale deposits add to this. Rivets are more reliable than the plates, as is shown by the rupture of the latter. Cold tests of boilers are not reliable, as the conditions are not those of practice. F. A. Scheffler said that manufacturers could not tell how a boiler would be handled after it left the shop, and that their only resource was to be on the safe side. He had found that the longitudinal seams were three-fourths as strong as the plate, and that the actual strength of the plate exceeded that stamped on it by the maker. If stamped 60,000, it would run from 60,000 to 68,000. Professor Hutton stated that the method of testing affected the results obtained, and he gave as an illustration a case he had had in which copper having a tensile strength of 38,000 pounds was specified. With the slow screw machine it was impossible to obtain this result, but when a hydraulic machine was substituted the desired tensile strength was reached, although the elongation was reduced. President Towne remarked that a standard form of riveted joint was needed, and also a standard method of making tests, and that the elastic limit, rather than the breaking strength, should be adopted as the only factor indicating the exact quality of the metal. E. F. C. Davis said: "We have full-sized testing machines in every boiler that explodes, and the proper study of them would throw much light on the subject."

"Bits of Engine-Room Experience," by L. F. Lyne, showed the harm done a cylinder in which shoulders had been formed at each end by the wear of the piston. The paper illustrated the uneven wear of valve stems, and closed with a description of how a bed of sulphur was removed from under an engine, and a bed of expansion metal (9 lead, 2 antimony and 1 bismuth) was substituted.

Oberlin Smith, in a written discussion of this paper, said that too much attention could not be paid to the reciprocating parts of a machine, and whenever possible the moving part should wipe over the ends

in order to prevent the formation of end-shoulders by the wear taking place in the center.

The paper of Mr. Lyne on the "Use of Crude Petroleum in Steam Boilers" was supplementary to the one read at the Philadelphia meeting in 1887. It compared crude petroleum with kerosene oil when used for the prevention of scale in steam boilers. In one of the two new boilers, which had the same amount of work to do and which worked under the same conditions, 1 gallon of kerosene oil was used each week, while a like quantity of crude petroleum was used in the other. At the end of a month No. 1 boiler had no dirt or scale in it, while in No. 2, using crude petroleum, there was considerable loose scale. Four months afterward about 1 bushel of hard, broken scales was removed from the back headers and tubes of No. 2. The other boiler was still clean, and only required to be rinsed with water. No. 2 boiler was then thoroughly cleaned, after which each boiler was given 1 gallon of kerosene oil a day, and at the end of six months both were found to be perfectly clean. The paper also gives important directions governing the use of oil.

One of the most interesting features of the meetings of this society is the so-called "Topical Discussions." These are questions upon live topics, in which the mechanical engineer is vitally interested, and they are so selected as to be taken as a whole—of importance to each member. The discussions are valuable, since the remarks are almost always based upon practical experience. One question was:

"Does it prevent nuts from working loose or prevent breakage of bolts to reduce their cross-section between the head and the nut?" Professor Sweet said, in a written communication, that a bolt would wear longer and would not work loose if the diameter of the plain part were reduced to the diameter of the bottom of the thread. The same thing could be accomplished by boring a hole down through the head to the thread. A bolt treated in this way had practically no weakest part, and was therefore better adapted to withstand strain, which was distributed over its entire length and not concentrated at one point. Professor Wood instanced the case of a steam-hammer head in which the tapered end of the piston-rod was driven in a tapered hole in the head. The rod frequently broke, and as it always broke a little below the upper surface of the head, the removal of the end from the hole was a difficult task. Mainly to obviate this trouble a groove was turned in the rod a short distance above the head, thereby reducing the section at that point, so that when it broke, as it was expected to, it would be an easy matter to remove the end. But this attempt to produce a convenient weak point for the rod to break at resulted in greatly increasing its life. G. E. Whitehead produced the same result in a milling machine arbor by reducing the shank by grooving to the diameter of the arbor.

"Have you tried the plan of applying electro-motors to mechanical operations requiring not more than 10 horsepower? Can you compare their convenience and economy with those of small engines, or the usual transmissions by belting and shafting?"

James Christie described a traveling gang-drill used at the Pencoyd Iron Works. This drill is located in the bridge shops, across which it travels. Owing to the overhead system of tracks it was impossible to use any method of transmitting power except by means of copper strips, forming an electric circuit. At the tracks the strips are broken and bridged. The current is taken off by brushes. The drill consists of eight independent radial drills, mounted four on each side of the crosshead. The whole

machine is moved forward and back along its track, the crosshead is raised and lowered, and the drills are all operated by a Thomson-Houston electric motor placed on top of the frame. All the movements are controlled by levers, placed within easy reach of the operator. The motor has never caused any trouble. C. J. H. Woodbury, described a method of hanging an electric motor to the shaft to be driven by means of a yoke-pinion and a gear on the shaft. As the load is applied the motor rises, the yoke and the motor at its lower or free end standing at an angle governed by the power required. When transmitting no power the yoke is in a vertical position; when transmitting the maximum amount of power the yoke approaches most nearly a horizontal position. President Towne stated that he had investigated the case of a crane in which the three motors needed would have cost, in the aggregate, more than the crane, making their use prohibitory.

During the afternoon the members enjoyed a sail on the beautiful bay upon which the city of Erie is located, and those who could remain witnessed a drill at the life-saving station.

The success of the Erie meeting was due largely to the well-directed efforts and the unusual harmony which characterized the work of the local committee, Messrs. Ball, Barnhurst, Hallock, Hardwicke, Miller, Selden, Scheffler, Skinner, Watson and Wilkin. A less conspicuous, though more important, part was played by the ladies of Erie, who succeeded most admirably in their endeavors to entertain both the Upper and Lower Houses composing the convention.

#### Reduction of Wages at Homestead.

About one year ago Carnegie Brothers & Company, Limited, of Pittsburgh, put in operation at the Edgar Thomson Steel Works, at Braddock, Pa., a sliding scale of wages, based on the selling price of steel rails, the principal product of the mill. When rails are selling at \$27 per ton the men are paid on that basis as long as that price is in force, while, if an advance or a decline takes place, wages are affected accordingly. It will be remembered that this sliding scale was not put in operation until after a long and bitter strike had taken place, during which the firm were compelled to secure Pinkerton detectives to guard their property. When the scale was first presented to the workmen they opposed it, claiming that it meant a large reduction in their wages. However, the scale has now been in force for about a year and is working to the entire satisfaction of both firm and workmen.

As soon as it was seen that this plant could be successfully operated in this way, Carnegie, Phipps & Co., Limited, made preparations to introduce a scale similar in its workings at the Homestead Steel Works. The firm have been engaged for months in perfecting the details, in order that it would be fair to both employers and employees. This has been accomplished, and on Saturday, the 18th inst., the following notice was posted in various places at the Homestead Steel Works:

Notwithstanding our leading competitors have reduced wages, which were already much below those paid here, we are met with numerous demands for advances, ranging in some instances from 25 per cent. to 68 per cent. Prices never were so low for our product. Nothing in the condition of business justifies a demand for advances in wages. We have, therefore, no choice but to meet the issue thus unfairly forced upon us, and once for all place the relations of capital and labor at these works upon a basis which may enable us to compete with others, and give steady employment to our men.

On and after July 1 next, the labor in these works will be thus paid. Steel blooms have been selected as the fairest obtainable basis

for the scale. Current quotations, as published in the Pittsburgh papers, will be taken as the standard.

The schedules of wages, which can be examined at the office, are based on present price of steel blooms, billets and slabs of sectional area, not less than 16 square inches, of \$27.50 a gross ton, on board cars Pittsburgh. Wages will be advanced or reduced as the average monthly selling price changes, but \$25 per ton will be considered the minimum, below which wages will not fall.

In establishing these wages it has been the aim to make the earnings of our men at least equal to those in the works of our principal competitors in Pittsburgh and elsewhere. In many instances they are higher than paid by others.

The superintendent will receive applications for employment from men at present in our service, and will select from among those whom he thinks best qualified in the order of their application.

Should any positions remain unfilled after June 1 next the superintendent will appoint other men to these vacancies. No man will be employed who cannot bring satisfactory certificates as to his skill, sobriety and general good character.

The firm desire no man to remain in their service who does not feel that he is obtaining as much or more for his labor than he could get elsewhere, and who does not prize steady employment free from strikes and labor quarrels.

In the interest of many well-disposed, fair men who may avoid future loss and disappointment by being told now that whatever may occur from the action into which labor at competing mills and the unwise demands for advances here have reluctantly forced us, the final result is sure. These works cannot run and pay higher prices than their competitors pay, nor will the firm any longer attempt to do so.

Men desirous of obtaining employment will be required to sign an agreement to work under this scale, which will stand until January 1, 1892, either party having the right to withdraw from it at that date, or at the end of any succeeding year, by giving notice of their desire to do so, not later than July 1 of any year after next year has expired.

By order of the Board of Managers,  
CARNEGIE, PHIPPS & CO., Limited.  
WM. L. ABBOTT, Chairman.

The workmen held a meeting on Sunday, the 19th inst. The sentiment of those in attendance seemed to be that the reduction was uncalled for, and would be rejected, even if it became necessary to stop work. After being in session for about three hours, during which a number of speeches were made, the following resolutions were presented and unanimously adopted:

*Resolved*, That the workmen of the Homestead Steel Works recognize that the adoption of the sliding scale, as proposed by Carnegie, Phipps & Co., will be giving up everything that is dear to the heart of every true workman; further be it

*Resolved*, That such a proposition, as presented by the company, is absolutely absurd, there being no foundation in fact for said notice.

*Resolved*, That the firm of Carnegie, Phipps & Co. have misrepresented the facts in said notices, and given broadcast to the public the statement that they had to pay more at their works in Homestead than their competitors have done for their work elsewhere, when the reverse is the case. One hundred tons of steel cost them no more than at any other union mill.

*Resolved*, That the firm of Carnegie, Phipps & Co. be condemned for their intention of declaring the various positions of the employees vacant one month previous to the expiration of the present agreement.

*Resolved*, That the whole matter be referred to the proper officials for adjustment.

From present indications a strike is inevitable unless the workmen agree to accept the scale, as it is the intention of the firm to insist upon its adoption, come what may.

**The Monitor Puritan.**—The double-turreted monitor Puritan, the largest of her class in the United States Navy, which was lately removed from League Island to Norfolk to receive additional machinery, will be completed at the Brooklyn Navy Yard, where the facilities at command will obviate any further delay. The vessel is built of iron throughout, armored with a steel-armor belt extending the entire length of the vessel, and carries four 10-

inch breech-loading rifles. She has a powerful ram, very strongly secured, and is fitted with a steam steering gear and steam windlass. On top of the armor belt is worked an armor deck 2 inches in thickness. The principal dimensions are as follows: Length between the perpendiculars, 280 feet; length on load line, 291 feet; length over all, 295 feet 8½ inches; breadth extreme, 60 feet 1½ inches; depth from fore line to top of main deck beams at middle line, 20 feet 9 inches; draft, 18 feet 2½ inches; area of greatest immersed transverse section, 1037 feet; displacement to load water line, 6000 tons; indicated horsepower, 3000; metacentric height, 10.2 feet; maximum speed, 13 knots; armor on sides, 12 inches; armor on turrets, 11½ inches.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., May 21, 1889.

The lead-ore hearing which ran through two days last week before the Secretary of the Treasury will from appearances be a somewhat prolonged question of consideration. The Secretary has given both sides the privilege of putting in testimony, and has extended the time to 15 days.

It is expected that it will require at least two weeks more to get the testimony into shape and another two weeks before a decision can be reached. Although it is a little early in the contest to talk about the probable decision, from the present indications, based upon general comments in the authoritative quarters, it is more than probable that the result of the hearing will be in favor of a radical change in the present mode of levying duty on lead ores.

In a very significant comment upon the hearing it was stated that the admission of such large quantities of lead ore free of duty was a violation of the spirit and intention, if not the letter, of the tariff statutes.

The present tariff act places a duty of 1½ cents a pound on lead ore and admits silver ores free. It was hinted that if some fixed rule were not adopted to define what is lead ore and what is silver ore it would be possible to admit all the lead ores into the United States free, as very few such ores are without silver; therefore it would be an easy matter by mixing to raise the component metal of chief value to a higher standard than lead ore.

It is probable that the Department will fix some standard of classification by designating all ores containing more than 5 per cent. or some fixed quantity of lead as lead ores.

The Secretary of the Treasury appreciates the great importance of the decision, and will give it a very careful consideration before venturing upon a decision.

The hypothetical case before Secretary Windom recommending increased duties upon worsted cloths by classifying them with woolen cloths, which the Secretary of the Treasury has been considering, has assumed tangible form in an appeal from a decision by the Collector of Customs at New York. In that case the collector levied upon an invoice of worsted cloths the woolen cloth rate, to which the importers had taken exception, and the case now comes before the Secretary of the Treasury. This will result in a decision in a very few days.

The Secretary of the Treasury has promulgated the following decisions relating to customs duties upon metallurgical products:

### POTASSIUM A METAL UNWROUGHT.

In an appeal from a duty of 20 per cent. on certain potassium the appellants claim that the merchandise in question should be exempted from duty by assimilation to

sodium named in the free list. The appraiser, reporting on this appeal, states "that the merchandise was found upon examination to be the elementary substance known as potassium, the metallic base of potash;" that potassium is similar in many respects to sodium, but that the scope of the section of the Revised Statutes "being limited to articles bearing a similitude to articles chargeable with duty does not appear to prevail in this case." He further states that, inasmuch as said potassium is an unwrought metal, and not specially provided for, it was returned for duty. While the appraiser seems to misunderstand the scope of the similitude clause, since its last proviso clearly applies to unenumerated articles similar in material, quality and texture and the use to which they may be applied to articles specified in the free list, his conclusion that the potassium in question is not entitled to exemption from duty by assimilation to sodium appears to be correct, inasmuch as potassium is similar to sodium in some respects only, and as it was otherwise provided for as a "metal unwrought," as aforesaid. The claim of the appellants has been rejected.

### RAZOR-BLADES DUTIABLE AS RAZORS.

An appeal having been made on a 50 per cent. ad valorem assessment of duty on certain razor-blades for 85 per cent. as cutlery, or 45 per cent. as manufactures of steel, the Department, affirming the collector's decision, says: "It appears that the merchandise in question consists of razor-blades which, although without handles, possess all the essential properties of razors and are in a condition ready for use when supplied with handles. Under these circumstances it would seem that the articles are in fact razors, and that the want of handles, which are merely appendages of the blades, does not affect their classification as such under the special provision for razors."

### Southern Freights on Pig-Iron.

The Southern Railway and Steamship Association have issued a circular on pig-iron rates, to take effect on June 1. To the principal points the figures are as follows:

To	From Birmingham, Ala.	From Chattanooga, Tenn.	From Sheffield, and Florence, Ala.
Akron, Ohio	\$4.00	\$3.50	\$3.75
Allegheny, Pa.	4.85	4.15	4.04
Atchison, Kan.	5.49	5.49	5.40
Bellaire, Ohio	4.85	4.15	4.40
Bellefonte, Ill.	3.25	3.00	2.80
Bridgeport, Ohio	4.85	4.15	4.40
Cairo, Ill.	2.75	2.50	2.50
Chicago, Ill.	4.00	3.75	3.75
Cincinnati, Ohio	2.75	2.25	2.50
Cleveland, Ohio	4.00	3.50	3.75
Columbus, Ohio	3.50	3.00	3.25
Dayton, Ohio	3.50	3.00	3.25
Detroit, Mich.	4.00	3.75	3.75
East Saginaw, Mich.	4.50	4.25	4.25
East St. Louis, Ill.	3.25	3.00	2.80
Evansville, Ind.	2.75	2.50	2.50
Fort Wayne, Ind.	3.75	3.50	3.50
Greencastle, Ind.	3.75	3.50	3.50
Indianapolis, Ind.	3.25	3.00	3.00
Kansas City, Mo.	5.49	5.49	5.04
Lafayette, Ind.	3.75	3.50	3.50
Leavenworth, Kan.	5.49	5.49	5.04
Lima, Ohio	3.75	3.25	3.50
Louisville, Ky.	2.50	2.25	2.25
Mansfield, Ohio	4.00	3.50	3.75
Memphis, Tenn.	2.00	2.00	1.55
New Albany, Ind.	2.75	2.50	2.50
Newark, Ohio	3.90	3.40	3.65
Peoria, Ill.	4.00	3.75	3.75
Pittsburgh, Pa.	4.85	4.15	4.40
Pullman, Ill.	4.00	3.75	3.75
Sandusky, Ohio	4.20	3.70	3.95
South Bend, Ind.	4.00	3.75	3.75
Springfield, Ohio	3.50	3.00	3.25
Steubenville, Ohio	4.85	4.15	4.40
St. Joseph, Mo.	5.49	5.49	5.04
St. Louis, Mo.	3.25	3.00	2.80
Terre Haute, Ind.	3.25	3.00	3.00
Toledo, Ohio	4.00	3.50	3.75
Wheeling, W. Va.	4.85	4.15	4.40
Zanesville, Ohio	4.00	3.50	3.75

A circular has also been issued relating to rates of freight on manufactured iron from Birmingham and Chattanooga. It does not differ from the rates published in *The Iron Age* of April 4, page 517.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street,  
CHICAGO, May 20, 1899.

A better feeling is perceptible in various branches of the iron trade, caused by increasing inquiry and a somewhat larger volume of business. A widespread belief has existed for some time that the tide would certainly turn by midsummer, but predictions are now being made that June will see decided indications of an improvement, which may not at first be accompanied by higher prices, but will in time have that effect. The attitude of heavy consumers indicates that they are ready to place large orders for future delivery in lines now neglected as soon as they have convincing evidence that bottom has been touched.

**Pig-Iron.**—The course of business during the past week would seem to presage a much more active business very soon. Some good orders have been placed for local Coke Iron, Southern Coke Iron and Lake Superior and Southern Charcoal. These sales were largely for early delivery, the Agricultural Implement manufacturers not being in the market yet with their season contracts. As far as can be ascertained, no orders have been taken up to this time for deliveries running into next year, but consumers are seeking to cover at least part of their monthly requirements until the summer of 1899, if they can do so at present prices. The Southern Iron most in demand of late has been Soft Iron, but some sales have been made, and in quite heavy quantities, of ordinary Foundry grades. Quotations continue about as they have been, with more or less shading to suit circumstances, governed by the extent of competition and the size of the order. We quote as follows for cash, f.o.b. Chicago: Local Coke Iron, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, \$16.50; Lake Superior Charcoal, \$19; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16; No. 2 Foundry and No. 1 Soft, \$15.25; No. 3 Foundry, \$14.75; No. 2 Soft, \$14.25; Gray Forge, \$13.75 @ \$14; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; ditto, lower grade, No. 1, \$17; No. 2, \$16; Alabama Car-Wheel, \$25.25.

**Bar-Iron.**—Orders are running all the way from carload lots to 50 tons, with quite a steady trade in this small way. Heavy buyers are holding aloof for the present, having their immediate wants well covered, and are indisposed to contract ahead at the higher rates which manufacturers are asking for that privilege. Prices are based largely on the rate asked by the Valley mills, which is 1.45¢ at mill, half extras, for Common Iron, not guaranteed. Single Refined Iron, of guaranteed tensile strength, is quoted at 1.70¢, half extras, at mill. Small lots from store are selling at 1.75¢ @ 2¢, according to quantity and quality.

**Structural Iron.**—The volume of business is fairly satisfactory in this line, but of course it runs mainly to Beams. Prices are firmly maintained, the mills making this kind of work being in receipt of large orders from other sections. Mill lots are quoted as follows, f.o.b. Chicago: Angles, 2.12¢ @ 2.15¢; Universal Plates, 2.15¢ @ 2.20¢; Sheared Plates, 2.20¢; Tees, 2.55¢, Beams and Channels, 2.90¢. Small lots from store are sold at 2.25¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees, and 3.4¢ for Beams.

**Plates, Tubes, &c.**—Dealers report that manufacturers of Plates are less disposed to accept orders at low prices and that some mills are unable to fill orders

promptly. The advanced price on Wrought-Iron Pipe is said to be well sustained. Should trade continue to improve another advance may soon follow. Quotations from store are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 57½ ¢ off for 1½-inch and less and 62½ ¢ off for 2-inch and larger.

**Sheet-Iron.**—The number of mills sold up and withdrawn from the market received further additions last week, and still orders for Black Sheets appear to be quite numerous. Prices are moving upward, and it would be difficult to find a place to put an order in at below 2.85¢ @ 2.90¢, at mill, for No. 27; Corrugating Sheets are 15¢ @ 20¢ @ 100 lb dearer. Store lots of Common No. 27 are quoted at 3.10¢ @ 3.30¢, according to quality.

**Galvanized Iron.**—The demand seems to be gradually improving. City cornice-makers and country merchants are increasing their orders, which come in more frequently. Makers of the best brands are refusing to meet the extreme low prices, because they find that they can now get orders enough to keep their mills full at better figures. From store Juniata is quoted at 65 ¢ off and Charcoal at 65 ¢ and 5 ¢ off.

**Merchant Steel.**—There are no orders of importance in sight that will be placed for early delivery. There is a class of consumers who are watching the market very closely, and occasionally ask quotations on 500-ton lots for the purpose of feeling the tendency of prices. In such cases deliveries are not stated, but in placing the order they would likely extend over all of this year. Small orders for low-grade Steels are fairly plentiful, and prices remain steady at about the following quotations: Soft Steel Bars, 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring, 3.75¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢; Sheet Steel, 7¢, 8¢ and 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Steel Rails.**—A light business is reported for the past week, but plenty of inquiries continue to be received. New railroad projects, which seemed to be hopelessly stranded but a few months since, are being resuscitated, and are securing funds to purchase track material, so that the future for the Rail trade is growing brighter. It would not be surprising if there was a pressure for short deliveries in the summer months which would appreciate prices, which are now quite firm, with \$29.50 @ \$30 quoted for strictly Chicago business.

**Track Supplies.**—The Rail trade having been quiet, but little business transpired in Fish-Plates last week. Other Track Material was also in limited demand. Small lots are quoted as follows: Steel Fish-Plates, 1.90¢; Iron Fish-Plates, 1.70¢ @ 1.75¢; Bolts with Square Nuts, 2.55¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.95¢ @ 2¢.

**Old Rails and Wheels.**—Old Iron Rails have been moderately active at about \$20. This price appears very high in comparison with other kinds of material, but the supply is quite contracted. In Old Steel Rails there is nothing doing. Old Car-Wheels are nominally quoted at \$16 @ \$17 in the absence of large transactions.

**Scrap.**—Dealers universally report complete stagnation. They continue to lay in stock when it is to be had at tempting figures, but very little goes out. Low-grade material holds its own better than high-priced stock, quotations being about as follows by dealers to consumers @ ton

of 2000 lb: No. 1 Wrought, \$17; Fish-plates, \$18; Axles, \$22; Horseshoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plates, \$9; Cast Borings, \$8; Wrought Turnings, \$10.50; Axle Turnings, \$12; Mixed Steel, \$10.50 @ \$11; Coil Steel, \$13.50; Leaf Steel, \$15.

**General Hardware.**—The active condition of trade continues in Shelf Hardware which was noted last week, the leading jobbers being particularly busy. While the business of either April or May has not been equal to that of March, it has been more profitable, as the orders ran more into Hardware and less into staple goods. The large sizes of Tin Roofing Plates have been advanced 50¢ @ 75¢ @ box. Prices range from \$9.50 to \$10.50 on standard grades. The Heavy Hardware jobbers are complaining somewhat of dullness. Collections are fair.

**Nails.**—Jobbers report a pretty fair demand for Steel Nails, and quote \$1.90 @ \$1.95 in carload lots, and \$2 from store in small lots. A rumor that the Western Nail Association is broken is being circulated in a quiet way. One of the mills has given notice of withdrawal, and this will be sufficient excuse for abandoning an agreement that has been of very little benefit for some time past. Wire Nails are quoted at \$2.35 for small lots from store, and carloads at \$2.80.

**Barb Wire.**—There is no change in the condition of the market. The demand continues good and prices low, notwithstanding the fact that makers cannot keep up with their orders. Painted Wire is quoted at 2.75¢ in small lots from stock and Galvanized at 3.35¢. These prices are demanded for carload orders.

**Pig-Lead.**—There is no change to report. Values have remained fairly steady at 3.75¢, though a weaker feeling prevailed toward the close of the week. Sales of 300 tons are noted at the above figures, and 3.70¢ bid for near deliveries.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., May 21, 1899.

**Pig-Iron.**—The market has developed no new features since date of our last report, although its course seems to indicate that the declining tendency has been arrested. The higher qualities of Foundry grades are taken in liberal quantities at \$18 for No. 1, while nothing below \$16.50 has been mentioned in the other direction, with medium quotations for the general average of the offerings. Mill Irons show a similar steadiness, \$14.50 @ \$15 being realized for Good Neutral Irons, without any special evidence of disproportion between supply and demand at these figures. Southern No. 3 has been offered rather freely, a sale of 6000 tons in one lot having been made by Justice Cox, Jr., & Co., at a trifle over \$14, delivered ex-ship Delaware River. The figures above named are believed to squarely represent the present condition of the Philadelphia market, and while the demand is not as active as could be desired, neither can prices be called weak. Holders are perfectly indifferent as regards business at less than the prices named, and further concessions appear to be quite improbable, unless sales are forced under special circumstances, such as a doubtful quality or to clean up odds and ends. In some directions there are prospects of a better demand although at this season it may not be safe to offer any very decided opinions on that point. Much will depend upon the turn of events further West. Any increase in the demand there would not only quicken the demand here, but would probably divert some brands from this into other markets. In other words, the position is extremely sensitive, and could be easily influenced



by developments favorable or the reverse, with the chances slightly inclining toward the former alternative. For the present, therefore, we have to report a waiting market, the outcome of the past week having been comparative steadiness, without much activity, closing with more inquiry and an apparent desire to pick up good Irons in liberal quantity, providing that prices are cut down to the lowest figures talked about 10 or 15 days ago.

**Foreign Iron.**—There is some inquiry for Bessemer, with buyers at about \$18 for average qualities, \$19 for special brands and \$27.50 for 20 % Spiegel, c.i.f., duty paid. Sellers ask \$19 @ \$20 for Bessemer and \$28 for 20 % Spiegel.

**Blooms.**—There is a good demand for Blooms and Billets, but prices are not as firm as could be desired, although in a general way the market is fairly represented by quotations as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 1/2 "Bloom" ton of 2464 lb.

**Muck-Bars.**—The market has been rather tame of late, buyers holding off and sellers not willing to reduce their quotations. Sales are reported at \$26.75, delivered, with \$27 asked, for good qualities, and \$26.50 bid.

**Bar-Iron.**—There is a better general demand, and although large orders are still scarce, mills appear to have secured a fair amount of business one way or another. Prices are said to be a trifle firmer, and the disposition is to get more money, as the output is somewhat affected by the hot weather. There is nothing yet that can be fairly called an advancing tendency, although manufacturers are not inclined to enter much business at current rates, believing that the chances are all in favor of a better market later on. Meanwhile, 1.72 1/2¢ @ 1.80¢ is asked for Best Refined qualities, but, as usual, there is a good deal of irregularity, according to what the order may be. Skelp Iron is beginning to move a little, with sales at 2¢ for Sheared, and 1.75¢ asked for Grooved.

**Plate and Tank Material.**—There has been a considerable demand for Plates, and mills are nearly all full of orders for May and June delivery. Some business has been offered for July and August delivery at current rates, but the manufacturers have not felt at liberty to accept it, believing that better prices will be in force by that time. There is a great deal of work going on, and the demand for Plates is expected to be usually heavy during the fall months. Prices are still pretty well down to the lowest of the year, but, as already stated, manufacturers think they have got all the orders they ought to have at prices which barely return first cost, although no one seems inclined to be the first to stand out for an advance. Nominal prices about as follows: 1.85¢ @ 1.95¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.1¢ for Universal Plates; Shell, 2.3¢ @ 2.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.25¢; Shell, 2.5¢; Flange, 2 1/2¢ @ 3¢; Fire-Box, 3 1/2¢ @ 4¢.

**Structural Material.**—A fairly active demand is reported in this line, new business being somewhat in excess of the week's deliveries. Manufacturers are very much encouraged by the outlook, and while prices are still on a low plane, it is believed that the increasing demand will soon bring about a corresponding improvement in values. Meanwhile quotations are about as before, viz.: Bridge Plate, 1.95¢ @ 2.05¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—There is no special change to note in this department, the demand is well maintained, and prices are steady for all descriptions. Mills are running full without accumulating stock. Prices remain as before, viz.:

Best Refined, Nos. 14 to 20. .... 3¢  
Best Refined, Nos. 21 to 24. .... 3.20¢  
Best Refined, Nos. 25 to 26. .... 3.40¢  
Best Refined, No. 27. .... 3.50¢  
Best Refined, No. 28. .... 3.60¢  
Common, 1/4¢ less than the above.  
Best Soft Steel, Nos. 14 to 20. .... 3 1/4¢  
Best Soft Steel, Nos. 21 to 24. .... 3 1/2¢  
Best Soft Steel, Nos. 25 to 26. .... 3 3/4¢  
Best Soft Steel, No. 27. .... 4¢  
Best Bloom Sheets, 1/4¢ extra over the above prices.

Best Bloom, Galvanized, discount. .... .65 %  
Common, discount. .... .67 1/2 %

**Steel Rails.**—Business is still dull and inactive, although there are inquiries on the market which seem to promise a good deal of activity before the season is over.

**Old Rails.**—No sales have been reported in this market for some time past, so that prices are merely nominal at from \$22 to \$22.50, as covering both extremes of the market.

**Scrap-Iron.**—There is a demand for good lots at quoted rates, but other descriptions are dull and irregular. Prices about as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—There is a good business doing, and at the advance recently quoted, prices are firm. Prospects are considered to be unusually promising as regards the volume of business, while prices show a hardening tendency. Discounts as follows: Butt-Welded Black, 52 1/2 %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52 1/2 %; Boiler Tubes, 60 %.

**Nails.**—There is a good demand for Steel Nails, but Iron are very quiet, and, unless for Standard makes, prices are irregular. Carload lots about \$1.80; lots from store, \$1.90 @ \$2.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Ave. {  
PITTSBURGH, May 21, 1889. }

The general situation here is improving in some respects, while in others it is not. There is an increasing demand, but labor complications are growing more numerous. Mill owners say that it is impossible for them to pay the present wage-scale and compete successfully with other points where the cost of labor is much less.

The trouble at the Rail mill of the Allegheny Bessemer Company, at Duquesne, is regarded as being about over, as the mill is being operated by non-union men and may be placed in the list of non-union mills. At the Solar Iron Works (Wm. Clark & Sons), a non-union mill, there was a strike a few days since, owing, as alleged by the men, to the firm acting in bad faith, which is denied by the latter. The works have been started up again, and it is the intention of the firm to keep it a non-union mill.

It is expected that a considerable reduction will be demanded by mills operated by Amalgamated Association men when the wage-scale comes up for consideration next month, and unless it is conceded there will probably be a pretty general suspension for a time at least. The feeling continues to obtain that it would be much better to have this wage-scale settled for three years instead of one; that it would be more satisfactory for both interests, and that other lines of trade in this district dependent upon the Iron interest would be benefited thereby.

The river Coal interest is very dull at present. Many of the mines in the Monongahela and Youghiogheny valleys have shut down for the present, and until stocks in the down-river markets have been considerably reduced they are not likely to be started up again. It is claimed that present prices for Pittsburgh Coal in New Orleans scarcely cover lay-down cost. It is claimed that nearly all the furnacemen in this district have been buying considerable Lake Ore recently, with the assurance on the part of the Ore companies that if the market should take a turn backward, which is not expected, they (the furnacemen) who have bought will be taken care of. In consequence, it is probable that some large Ore contracts have been made in this district.

**Pig-Iron.**—There is nothing particularly important to note, with the exception that the feeling appears to be gaining ground that the market has about touched hard pan, although here and there an operator is found who predicts still lower prices. So far as we can learn, none of the furnaces in this district are willing to sell Neutral Gray Forge below \$14, cash, and some of them are indifferent in regard to contracting for future delivery even at that price; they are selling along for present or near-by delivery, but do not care to sell ahead. While some consumers are still holding off, there are others who would not object to contracting for future delivery at ruling prices; hence, while the market has been comparatively quiet the past week the general feeling, if anything, is firmer, and furnacemen generally are as indifferent about selling as consumers are in regard to buying, if not more so. The market is in that position that it would not require very much to stiffen it up, and there is a possibility if not a probability that those consumers who are holding back with the intention of filling up as soon as hard pan has been reached will wake up some of these days and realize that they have made a mistake. We quote prices as follows:

Neutral Gray Forge. ....	\$13.75 @ \$14.00, cash
White and Mottled. ....	13.00 @ 13.50, "
All-Ore Mill. ....	14.50 @ 15.00, "
No. 1 Foundry. ....	16.00 @ 16.25, "
No. 2 Foundry. ....	15.00 @ 15.25, "
No. 3 Foundry. ....	14.50 @ 14.75, "
No. 2 Charcoal Foundry. ....	21.00 @ 21.50, "
Cold Blast Charcoal. ....	24.00 @ 27.00, "
Bessemer Iron. ....	16.00 @ "

No sales of Bessemer Iron reported. So far as we can learn there have been no sales below \$16, cash, and it is doubtful whether it can be bought below that figure.

**Muck-Bar.**—Good strong neutral Muck may be quoted steady at \$26, cash; it can be had at that figure, but nothing less. Some mills refuse to sell at that price. It has been discovered that there is a difference between that made for sale and for use by the maker; that the latter as a rule is much better than the former.

**Spiegel.**—Small sales of 20 % at \$30 @ \$30.50, cash, and of Ferromanganese, 80 %, at \$58, cash.

**Manufactured Iron.**—The general Merchant-Iron trade continues slow for the season, but the demand is improving and some of the mills are moderately well employed; prices—that is, for first quality Iron—are still quoted upon a basis of 1.60¢ @ 1.70¢, 60 days, 2 % off for cash. There is a continued good demand for Skelp Iron, and all the mills making a specialty of it have about all they can do. Prices are firmer but unchanged; 1.62 1/2¢ @ 1.65¢ for Grooved, and 1.90¢ @ 1.95¢ for Sheared.

**Nails.**—There is no improvement to report in the demand for Cut Nails, and prices continue irregular, quoted all the way from \$1.75 to \$1.85 for 12d @ 40d, 60 days, 2 % off for cash. Wire Nails are quoted at \$2.15 @ \$2.20, 60 days, 2 % off for cash, for large lots, and \$2.25 @ \$2.35

in a jobbing way. Carnegie, Phipps & Co. deny having made any sales as low as \$2.15, but we are informed that some large orders were taken by some firm recently at the price quoted. It is claimed that the Cut Nail has a better adhesive quality than the Wire Nail, and that at present prices the former is the cheapest of the two.

**Wrought-Iron Pipe.**—The Pipe trade continues active, the mills being all busy; some of them are sold several months ahead, and the combination prices are being faithfully adhered to. As stated in our last report, the Pipe mills are now all in the combination, and the market is in a very satisfactory condition. Prices remain unchanged. Discounts on Black Butt-Welded Pipe, 52½¢; on Galvanized do., 45¢; on Black Lap-Welded, 65¢; on Galvanized do., 52½¢; Boiler Tubes, 1½ inches and smaller sizes, 57½¢ off; 2 inches and larger, 62½¢ off; Casing, 5½ inches, 62½¢ off; other sizes, 60¢; 2-inch Tubing, 13¢ per foot net; 3-inch Line Pipe, 20¢ per foot; 6-inch do., 56¢; 8-inch, 90¢. The next regular monthly meeting of the Pipe Association will take place in Pittsburgh on June 8.

**Old Rails.**—The demand for Old Iron Rails continues light, while prices remain unchanged; sales of 1200 tons at \$21.50 @ \$21.75. Consumers say that they can buy all that they want at the inside quotation. Old Steel Rails are still quoted \$17 @ \$17.25 for short and \$19 @ 19.50 for long lengths.

**Steel Rails.**—Both of the mills here are pretty well supplied with orders, and the market is reported firmer. Heavy sections may be quoted at \$25 @ \$26, cash orders, at works. It is thought the very low price of Rails will stimulate railroad building, and that in this respect there will be a better showing the latter part than during the first half of the year.

**Billets, Blooms, &c.**—Sales of Bessemer Billets and Blooms at \$27, cash, which appears to be the ruling price. Nail Slabs, \$26.50. It is stated that a firm at Wheeling has contracted with a mill here to convert Slabs into Skelp Steel, paying freight on the Slabs from Wheeling to Pittsburgh, and on the Skelp Steel from Pittsburgh to Wheeling, where it is to be made into Steel Pipe and shipped back to New York. Bloom Ends and Rail Crops ruled at \$17 @ \$17.25.

**Railway-Track Supplies.**—There is a fair business at unchanged prices; Spikes 2¢, 30 days; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, \$2.75, with Square, and \$2.85, with Hexagon Nuts.

**Old Material.**—Demand for everything in this line continues light, and prices are weak but unchanged; No. 1 Wrought Scrap, \$18 @ \$18.50, net ton; Car Axles, \$24 @ \$24.50; Wrought Turnings, \$18; Cast Scrap, \$14 @ \$14.50 gross; Old Car Wheels, \$18 @ \$18.50 gross.

## Louisville.

LOUISVILLE, KY., May 20, 1889.

**Pig-Iron.**—The market has been very quiet during the past week, with very little buying. Different views are expressed by consumers in regard to the course the market will take. Some hold that the conditions are such that a strong advance may take place during the course of the year. Others feel that the large number of furnaces, the accumulation of Iron, and the fact that so far there has not been a general movement to shut down, will necessitate extremely low prices for several months, and their fears are that Iron will go even lower. Buyers would prefer higher prices, as the low purchases are of no advantage, they in turn having to make

extremely low prices to consumers. The Lady Ensley Furnace, at Sheffield, is now in blast and running largely on Nos. 1 and 2 Foundry, with some No. 3 Foundry. The furnace is using all-brown Ore and Pocahontas Coke, and the intention is to make one of the best Irons South. The Trussville Iron has been on the market for some time, with very satisfactory results. The Iron is strong and well graded, and consumers rank it with the best Southern Irons. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry, new classification.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry, new classification.....	13.75 @ 14.25
Gray Forge.....	13.25 @ 13.75
White and Mottled, different grades.....	12.75 @ 13.25
Silver Gray, different grades.....	13.00 @ 13.50
Southern Charcoal, No. 1 Foundry No. 1 Mill.....	16.25 @ 16.75
Southern Car-Wheel, standard brands.....	14.75 @ 15.25
Southern Car-Wheel, other brands.....	21.75 @ 22.75
Hanging Rock Coke, No. 1 Foundry.....	18.00 @ 19.50
Hanging Rock Charcoal, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Cold Blast.....	19.50 @ 21.00
	20.75 @ 22.75

## Detroit.

WILLIAM F. JARVIS & Co., under date of May 20, 1889, report as follows: Business has been dull during the past week, and while there have been inquiries for a fair amount of Coke and Lake Superior Charcoal Irons, the sales have not been as large as usual at this time of the year. Notwithstanding the dullness, there are very few furnaces that desire to contract for deliveries very far ahead, unless at higher prices than are ruling at present. In most cases Lake Superior is held firm, but in a few instances we have heard of some cutting having been done, but are not prepared to say whether report is true or not. With a quiet market we quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.00 @ 19.00
Lake Superior Coke, cinder mixed.....	17.25 @ 18.25
Standard Ohio Black Band.....	18.00 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.00 @ 16.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.75
Old Wheels.....	18.50 @ 19.00

## Cleveland.

CLEVELAND, May 20, 1889.

**Iron Ore.**—The sales reported for the past week have included a considerable quantity of non-Bessemer Ore at an average price of \$3.75 per ton, Cleveland delivery. A few thousand tons of this Ore brought \$4 per ton, but a larger quantity \$3.60 @ \$3.75. Scattering orders for non-Bessemer Specular and Magnetic Ores at \$4.75 @ \$5 per ton have also been placed. Additional sales to Eastern furnacemen have brought the aggregate purchases of buyers in that locality up to nearly 700,000 tons. Gogebic Bessemer Ores are in fair demand at \$4.90 @ \$5.25. The total business for the past week has, however, been considerably below the record for the preceding seven days. A large amount of Ore was sold, but the orders placed were mostly for rather small amounts, and the aggregate sales did not exceed 200,000 tons, bringing the total amount sold since the opening of the market for new Ore up to about 3,500,000 tons. Pittsburgh furnacemen are still buying sparingly, hoping for the same decline in prices that characterized the midsummer market in 1888. A scarcity in ready tonnage to load Ore has led to some talk of higher lake freights, but the charters reported for the week have been at the prevailing rate of 90¢ from Escanaba; \$1.10 from Marquette, and \$1.25 from Ashland and Two Harbors. The amount of Ore being shipped from the Lake Superior district is something enormous, over 600,000

tons having already been forwarded, against about 150,000 tons shipped up to a corresponding period last year. Dealers to-day report sales of Gogebic Ore from the Aurora and Ashland mines at \$3.25, f.o.b. vessels Cleveland.

**Pig-Iron.**—The slightly encouraging features of the market have been retained, although there is little in the present situation to justify any enthusiasm or a very large measure of hope for the immediate future. There is a disposition on the part of the sellers to stand by the present quotations for desirable Irons for which the demand has improved. The following are the quotations:

Nos. 1 to 6 Lake Superior Charcoal.....	\$20.00 @ \$20.50
No. 1 Strong Foundry, Bessemer quality, per ton.....	16.50 @ 17.00
No. 1 Strong Foundry, per ton.....	16.00 @ 17.00
No. 2 Strong Foundry, per ton.....	15.00 @ 16.00
No. 1 American Scotch, per ton.....	16.50 @ 17.00
No. 2 American Scotch, per ton.....	15.50 @ 16.50
No. 1 Soft Silvery, per ton.....	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, per ton.....	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, per ton.....	14.50 @ 15.50

**Old Rails.**—Sales of Old American Rails at \$21 are reported and the inquiry is improving.

**Manufactured Iron.**—Sheets are firm and in good demand; Common Bar is still quoted at 1.60¢.

(By Telegraph.)

The official announcement to-day that freight rates for carrying Iron Ore from Lake Erie ports to the Pittsburgh and Mahoning Valley furnaces had been reduced breaks the deadlock between mine owners and the Carnegie interests, and 1,000,000 tons of Ore will consequently be sold within the next few days. Orders are already announced for the best grades of Gogebic Bessemer at \$5.25, Cleveland delivery; for Menominee Bessemer, \$4.90 and \$5.15, and for large quantities of high-grade Bessemer Ores. The new rate to Pittsburgh is \$1.05 per ton, a reduction of 20¢, and to the Mahoning Valley 62½¢, a reduction of 10¢. Cleveland furnacemen will immediately ask for a corresponding reduction in Coke freights in order to compete with the manufacturers of Pittsburgh and the Mahoning Valley.

## St. Louis.

OFFICE OF The Iron Age, 214 N. Sixth st., St. Louis, May, 20 1889.

**Pig-Iron.**—The market remains in about the same condition as last noted. One sale of 500 tons Southern Gray Forge was made a few days ago at \$13, four months' time, delivered at a point close by the city. This makes the price at furnace about \$9.50 per ton, which, to say the least, is not very encouraging. Of course sales of this character do not entirely represent the condition of the market, but they go far toward showing how anxious some furnaces are for business and what figures will be accepted to obtain same. The outlook is not very promising, and unless the demand improves prices are liable to go still lower, although this hardly seems probable, as buyers are sending in inquiries for some good round lots, which, if sales are consummated, will have a beneficial effect on prices, which are quoted as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75	
Southern Coke, No. 2 Foundry, 14.75 @ 15.25	
Southern Coke, No. 3 Foundry, 14.25 @ 14.50	
Gray Forge.....	13.25 @ 13.75
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	19.75 @ 21.50

### Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

### Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00
Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.	

**Bar-Iron.**—The demand continues to improve, and there are some pretty fair orders being booked for the railroads, which appear anxious to a certain extent to place their orders, now that bottom seems to have been reached. Consequently there is a better feeling and mills are more hopeful. Prices show some signs of improvement in the near future, and are quoted with more firmness than for some time. Small lots from store, \$1.80; carload lots, from \$1.60 to \$1.70, according to circumstances.

**BarbWire.**—The demand keeps up strong for the season and mills are being kept well employed, and in some cases are pushed to make deliveries. Prices are firm and generally adhered to. Mills quote from \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized. Carload lots are quoted at from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

John W. Good, late with Sligo Iron Stone Company, St. Louis, and L. McGilvray, for a number of years agent for P. L. Kimberly & Co., Sharon, Pa., have formed a partnership as manufacturers' agents, and established themselves in the Laclede Building, St. Louis, Mo. Among the well-known firms represented by them are P. L. Kimberly & Co., Sharon, Pa.; Standard Iron Co., Bridgeport, Ohio; Lawrence Iron and Steel Company, Ironton, Ohio, and Calumet Iron and Steel Company, Chicago, Ill., for whom they represent the P. C. P. Steel Nail.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, May 20, 1889.

**Pig-Iron.**—Much to the surprise of many of our Pig-Iron men the past week has developed a spirited demand, and prices are decidedly improved—i.e., there is not the same disposition to accept offers that existed before, and upon the whole the atmosphere is somewhat brighter. This is about all that can be said of the situation now. Several round lots have been sold for future deliveries, and the idea has gone out that if large desirable lots are bought a little higher figure will be paid. There appears to be no letting up in the disposition of Northern capital to come down here to invest in mineral property, and many of them say as soon as they get matters straightened out they intend erecting furnaces.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, May 22, 1889.

**American Pig.**—The majority of sellers report the market quiet, with only a few comparatively large transactions reported. A feeling exists among a number of consumers that the much-talked-of contest between Northern and Southern furnaces still contains possibilities of lower prices. They argue that if all which is said in connection with the ability to place Pig-Iron on the market at low cost is true, there is still considerable margin for another cut. Southern Iron is being freely offered at \$16, ex-ship, for No. 1 Foundry, and reports of prices below that figure are freely circulated. Thus far they have a foundation only in isolated instances. The Thomas Company report deliveries quite active, and they are taking new business very cautiously, it being claimed that the capacity is pretty well engaged. We understand that two more furnaces of the company are about to be blown in. We quote Standard Northern Iron, \$16.50 @ \$17.50 for No. 1; \$15.50 @ \$16 for No. 2, and \$14.50 @ \$15.25 for Gray Forge. Southern Iron is

selling at \$16 @ \$16.50 for No. 1, \$15 @ \$15.50 for No. 2, and \$14.25 @ \$14.75 for No. 3.

**Scotch Iron.**—The market is very dull, with Coltness nominally \$21.50 @ \$21.75; Summerlee, \$21.25 @ \$21.50, and Dalmellington, \$20.25 @ \$20.50.

**Structural Iron and Steel.**—The volume of business in the way of small orders for Architectural-Iron Work is quite satisfactory, and some larger orders are still pending. There is quite a lively inquiry for bridge work, but, in spite of the fact that the shops are well employed, competition is very keen and prices are low. We continue to quote Sheared Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢ @ 2.1¢; Angles, 1.9¢ @ 2.1¢; Tees, 2.35¢ @ 2.5¢, and Channels and Beams, 2.8¢, on dock.

**Plates.**—There are a number of good orders in the market. We quote Iron Tank, 1.9¢ @ 2.2¢; Shell, 2.25¢ @ 2.4¢; Steel Tank, 2.15¢ @ 2.25¢; Shell, 2.35¢ @ 2.4¢; Flange, 2.55¢ @ 2.75¢, and Firebox, 3¼¢ @ 4¢.

**Bar-Iron.**—The market remains dull. We quote: Carload lots on dock, Common, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.7¢ @ 2¢.

**Steel Rails.**—There is quite a run of small orders, which, it is claimed, can be filled at \$27.50 at tidewater, which would net the active mills from \$26.50 to \$26.75, at mill. From the South there is considerable inquiry. But little business on a large scale is reported either East or West. We quote nominally \$26.50 @ \$27.50 at Eastern mill.

**Wire Rods.**—No business whatever is reported. quotations remaining nominally \$41.50 @ \$42 for Foreign Rods.

**Old Rails.**—We hear of no sales, and continue to quote the market nominally \$22 @ \$22.50 for Tees.

**Fastenings.**—We quote \$1.90 @ \$2 for Spikes, and 1.7¢ @ 1.9¢ for Angles, Iron or Steel.

**Scrap-Iron.**—The demand still remains unsatisfactory, and the amount of business being placed is very small. We continue to quote: No. 1 Scrap, \$20 @ \$21, according to the location of yard, for cargo lots, delivered; Turnings, \$18.50 @ \$14; Cast Scrap, \$15 @ \$16; Borings, \$9.50 @ \$10.

**Spiegeleisen and Ferromanganese.**—The market is very dull, with 20 % Spiegeleisen being offered at \$27.50. A small business is being done in 80 % Ferromanganese at \$57.50 @ \$58.

G. H. Hull & Co. have established themselves at 71 Broadway as Pig-Iron merchants, Jared N. B. Reis being manager.

## Financial.

General trade advices, excepting as encouragement is derived from the prospect of abundant crops, incline to a somber hue. A serious drawback is the difficulty of realizing profits on a declining market, especially in manufacturing, where rates of wages do not readily become adjusted to correspond with a shrinkage in values, expenses in other respects often remaining as before. It appears from a comparison of the average prices prevailing now and in 1860 that in a wide range of commodities entering into ordinary competition in about seven-eighths of all descriptions there is a decline of something like 24 %, and in casting about for an explanation the theory is advanced that the depression is a legitimate and inevitable consequence of the collapse of combinations designed to resist the downward tendency. Breadstuffs, grain and provisions are this week again quoted dull, weak and lower.

In these lines continued fine weather for growing crops and corn planting has a depressing influence, taken in connection with a slack demand. A very large surplus in the yield of wheat this year is now considered assured, and this in addition to some 45,000,000 bushels of the old crop still in reserve—as a consequence of an artificial blockade of the export market at a time when more remunerative prices were possible. Just now the corn movement West is unusually large. Cotton is very strong, and spots are advanced ½¢ on quotations, with a good export demand. Groceries are quiet, coffee dull, sugars steady, teas moderately active, other goods slow. Dry goods jobbers are in the transition period between fall and spring, with indications of an early development. In an opinion of the Interstate Commerce Commission, just printed, reference is made to the question of uniform classification of freight. The commissioners say this subject is now under consideration by a standing committee organized by selection from the railroads and associations in all parts of the United States, which is working in the direction of uniformity throughout the entire country. In this city favorable opinions are expressed by the railroad men of the practical workings of the law and the association over which Mr. Walker presides.

In the Stock Exchange markets interest has centered in the movements of the belligerent factions seeking to control the Oregon Transcontinental. An issue of \$10,000,000 preferred stock was enjoined by the courts, and the Villard party then sought to retain control through purchases of stock. On Friday a partial corner was covered by purchases for non-delivery, and on Saturday the market became animated throughout. Chicago, Burlington and Quincy came to the front with a net advance of over 2 %. Atchison ranked second, closing 1 % higher, while Oregon Transcontinental, which was third in point of activity, closed with a net gain of 7 %. St. Paul preferred was a feature, and so was Rock Island, both at materially higher prices. The reorganization of the Wabash was completed by the sale of the last of the property in the hands of the receiver for \$15,550,000. On Monday the excitement in Oregon partly subsided. The supposition that President Villard had gained a point had a marked effect upon the securities of the Northern Pacific. On Tuesday stocks were very active, and a reaction in the forenoon was followed by renewed buoyancy. Reading was the feature. Oregon Transcontinental had a further decline and the Northern Pacific lost a fraction of Monday's advance, but the markets closed strong.

Government bonds closed as follows:

U. S. 4½s, 1891, registered.....	100½
U. S. 4½s, 1891, coupon.....	107½
U. S. 4s, 1907, registered.....	120½
U. S. 4s, 1907, coupon.....	120½
U. S. currency 6s.....	121½

The bank return for the week shows an increase of \$5,231,750 in surplus reserve, which now stands at \$14,082,325, the largest since February 23 last. The loans show a contraction of \$3,645,500; the specie is increased \$3,469,300; the legal tenders are up \$2,477,400; the deposits other than United States are increased \$2,859,800. The shipment of nearly \$3,000,000 in specie will be reflected in the forthcoming statement. Despite the outward movement, money is extremely easy, time money, 2½ % for 60 days, 3 % for four months, 3½ % for six months and 4 % for eight months. Commercial paper in good demand, but offerings are light. Quotations are 4 % @ 4½ % for prime double name and 4½ % @ 5 % for best single name.

The market for sterling was steady. Recent shipments of gold resulted from small foreign purchases of securities, and further specie exports are looked for. Cot-

ton bills will appear in a few weeks. Posted rates are \$4.88 @ \$4.89½.

The total amount of bonds purchased from August 3, 1887, to date is \$168,639,100, of which \$61,590,250 were 4 per cents and \$107,048,850 4½ per cents. Their cost was \$194,859,750, of which \$78,928,883 was paid for the 4 per cents and \$115,930,866 was paid for the 4½ per cents.

The United States Savings Bank, Constant A. Andrews president, was opened in East Fifty-ninth street.

Failures during the week number 252, against 189 for the same time last year.

## Metal Market.

**Copper.**—The conference that was being held among representatives of the Copper mining companies at the time of our last report resulted in an agreement that the price for deliveries made to consumers since the collapse of the syndicate is to be 12¢ for Lake Ingot, the same figure to apply to all fresh business up to July 1. As a basis for determining the selling price of their goods this figure suits the manufacturers very well, but they, on the other hand, do not exhibit the least anxiety for new business in Ingot Copper at the price fixed on Lake as long as the agreement exists between the companies and European bankers as to the disposal of accumulated supplies of American Copper on this side under control of the latter, nor among these about the enormous amounts held by bankers in Europe. Our consumers consequently try to get along as well as they may without buying a pound of Lake Copper at 12¢, feeling confident that the latter figure cannot be long sustained; if it were 10¢ instead, or less, it would be different. Under the circumstances we are not much nearer a practical solution of the general situation of the metal than we were a week since. A conference between the mines was held last night, at which "progress was made." London improved from £38.12/6, spot, at our last writing to £39.15/ yesterday, and futures from £38.10/ to £39.10/, sales summing up 1000 tons. The visible supply in England and France on May 15 was 122,740 tons. The price on Copper Tubing has been reduced 4¢, and on Brass Tubing 3¢. On Sheets the reduction has not yet been announced.

**Tin.**—London once more took an upward turn, with spot rising since our last from £92.12/6 to £93.17/6 yesterday, whereas futures gave way from £93.10/ to £92.10/, with sales aggregating 500 tons. During the day or two when the cable reports from the other side were a little more buoyant some 250 tons of Tin were sold, 150 of which on 'Change at 20.70¢ down to 20.60¢, spot; 20.90¢ @ 21¢, July, and 20.85¢, spot deliveries. At the Exchange, between calls, 30 tons spot were sold at 20.40¢. The closing price for spot Tin is 20½¢ @ 20¼. **Tin-Plates.**—Our market has been unexceptionally dull, with slightly lower figures in a few instances. Liverpool is nominally unchanged, but orders at a slight grading are being booked. We quote large lines, ordinary brands, 30 box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.25 @ \$4.35, and Wasters \$4.12½ @ \$4.15.

**Lead.**—As decision on the part of the Secretary of the Treasury in the Mexican Ore duty question may tarry for a month or more, the market here and in the West at once took a downward course once more; still there is a firm undertone at the reduced closing figure. Sales for the week amounted to some 600 tons, taken by consumers in the open market at from 3.75¢ down to 3.70¢, the market winding up at

the inside figure. St. Louis quotes 3.50¢ @ 3.55¢.

**Spelter.**—The demand out West, for galvanizing purposes in particular, is described as being unusually cheery this spring; as at the same time the demand East is improving, we cannot quote Common Domestic any lower than 4.85¢, at which a moderate trade is being done. Silesian is worth 5½¢.

**Antimony.**—Has remained moderately active and steady at 13½¢ for Cookson's brand, and 12½¢ for Hallett's.

## New York Metal Exchange.

The following sales are reported:

THURSDAY, May 16.	
10 tons Tin, September.....	20.85¢
20 tons Tin, July.....	20.90¢
25 tons Tin, July.....	20.95¢
25 tons Tin, June.....	21.00¢
FRIDAY, May 17.	
20 tons Tin, spot.....	20.65¢
10 tons Tin, spot.....	20.60¢
10 tons Tin, delivery May 20.....	20.60¢
25,000 pounds Lake Copper, September.....	11.50¢
MONDAY, May 20.	
10 tons Tin, spot.....	20.00¢
TUESDAY, May 21.	
100 tons Lead, September.....	3.80¢
WEDNESDAY, May 22.	
30 tons Tin, spot.....	20.40¢

## Imports.

### Hardware, Machinery, &c.

Baylis & Crandale, Mach'y, bxs., 2  
Boker, Hermann & Co., Arms, cs., 58  
Curley, J. & Bro., Cutlery, cs., 2  
Chief of Ordnance, U.S.N., Machine  
Chynes, S. E., Hardware, bce., 1; Guns, cs., 11  
Field, Alfred & Co., Anvils, 20; Mdse., pgs., 2  
Foley, Edw., Mach'y, cs., 11  
Folsom Arms Co., H. & D. Arms, cs., 4  
Hartley, Graham & Co., Mdse., cs., 27  
Henderson Bros., Mach'y, pgs., 662  
Hoe, R. & Co., Mdse., cs., 2  
Kumhardt & Co., Mach'y, pgs., 8  
Lau, J. H. & Co., Arms, cs., 11  
McDermott, Walter, Steel Shoes, 20  
Merch. Desp. Co., Arms, cs., 8  
Russell & Erwin, Skates, box, 1  
Sacks, & R., Nails, cks., 9  
Sorzano, J. W., Mach'y, bxs., 4  
Schoverling, Daly & Gales, Arms, cs., 22  
Sheldon, G. W. & Co., guns, cs., 27  
Taylor, Thos., Mdse., cs., 8  
Thebaud Bros., Mach'y, pgs. and pcs., 161  
Van den Toorn, W. H., Arms, cs., 5  
Werlemann, H., Arms, cs., 6  
Ward, James E. & Co., Spikes, cks., 48; Locomotive and connections  
Wiebusch & Hilger, Lim., Mdse., cs., 22; Arms, cs., 10

## Coal Market.

The large Anthracite Coal companies appear to be making a spasmodic effort to put new life in the trade so far as this end can be brought about by increased activity at the mines. After many weeks of comparative idleness nearly all the collieries of the Pennsylvania Coal Company at Pittston have resumed on half-time, and those of the Delaware and Hudson Company in Carbondale and vicinity on three-quarters time. The Reading Company are prepared to put on the market 1,000,000 tons of Coal per month, equal to about 25% of the total monthly production heretofore, but it is stated that the number of working collieries will not be increased before June, as the stock on hand at Port Richmond is about 200,000 tons. The railroad company have added 1200 cars and 60 locomotives to its equipment. In the Lackawanna Valley several breakers started up during the week. The reported production for the week ending 18th inst. is 673,500 tons, an increase of about 90,000 tons compared with the previous week and the largest output recorded for a long time. Compared with the same week last year the increase is 56,000 tons. The aggregate is still about 1,500,000 tons behind the corresponding date in 1888. The principal gains last week were in the Lehigh Valley and in the Reading district. Better employment will

prevent the threatened migration of colliers to other districts. Shippers are detained by the scarcity of vessels, and freights are high.

Respecting prices the Philadelphia *Ledger* says: "Many of the contracts for Anthracite placed recently are for Coal for delivery during the next 90 days at the 'cut' prices which were ruling in the latter part of April and the first or second week of this month."

A. Pardee & Co. put about 50,000 tons on the Philadelphia market at 10¢ reduction, but offered none outside.

Bituminous Coal is plenty at lowest quotations.

A meeting of sales' agents was called for Wednesday to consider the expediency of an advance. Outsiders believed no chance in this direction would take place before July 1.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, May 22, 1889.

Merchant Bar Copper for immediate delivery has been scarce on the open market and the fluctuations in price have been small. The producing companies are still supplying the consumptive demand at fair rates, but decline to sell for forward unless covered. The French banks have apparently kept out of the market.

Fully 3000 tons Anaconda Matte have been offering on the market, and at last accounts only 1800 tons had been sold. The price realized was 8/.

Negotiations are in progress for the formation of a syndicate to purchase the assets of the Société des Métaux. English and French financiers are interested in the project. If successful, a public issue will be made in Paris and London.

Small shipments from the Straits, due to dealers there retaining supplies, served, in connection with continued purchases for America, to impart strength to the Block Tin market early in the week. Subsequent realization and very dull demand caused a reaction, and prices are today about £1 lower than a week ago, with the market rather depressed.

There has been no improvement in the business in Tin-Plate, but makers are hopeful, and anticipate a larger demand. Ordinary sorts are still a drug on the market.

The strike at the Worcester and the Forrest works has terminated, and the mills will be started up shortly. Six of the largest firms in Midlands have joined a combination to advance prices.

The Pig-Iron market has been rather dull, particularly in the warrant speculation, and the "bears" have sold freely. Prices for makers' brands of Scotch are barely steady, and Middlesboro' has sold 3d off. Six furnaces have been relit in Scotland. The Dixons' works have sold 25,000 tons Cumberland Hematite for Italy recently, and further business of magnitude for the same market is said to be under negotiation.

In the Steel trade there is a very good business, more particularly in Rails, Blooms, Billets and shipbuilding descriptions. Prices are firm all through, but no higher than last week.

Old Material is difficult to buy, except at full figures, but there is no business of importance passing in Rails or in Scrap.



**Scotch Pig.**—Business has been rather slow and prices have varied but little.

No. 1 Coltness, f.o.b. Glasgow	55/6
No. 1 Summerlee, " "	54/6
No. 1 Gartsherrie, " "	52/6
No. 1 Langloan, " "	54/6
No. 1 Carnbroe, " "	47/8
No. 1 Shotts, " at Leith	53/8
No. 1 Glengarnock, " Ardrossan	51/8
No. 1 Dalmellington, " "	46/
No. 1 Eglinton, " "	44/

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

**Cleveland Pig.**—The trade moderate at present and prices barely steady. No. 3 Middleborough, G.M.B., quoted 39/ prompt.

**Bessemer Pig.**—A very fair business in this line and prices steady. West Coast brands, mixed numbers, 49/, f.o.b. shipping point.

**Spiegeleisen.**—The market remains firm, with demand good. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

**Steel Rails.**—Demand fairly active, and the market very firm. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—There is still a good business at firm prices. We quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Prices firm and the demand fairly active. Bessemer, 2½ x 2½ inch, £4. 10/, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Only a moderate trade in these, but sellers firm. Bessemer, £4 2/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—The trade moderate, but sellers firm. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap-Iron.**—Sellers firm on prices, but the demand moderate. Heavy wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—A moderate business and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin-Plate.**—Rather more business than last week, but the movement still moderate. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @ 13/9
IC Siemens	14/ @ 14/3
IC Coke, B. V. grade	13/ @ 13/3
Charcoal Terne, Dean grade	12/ @ 12/3

**Manufactured Iron.**—Trade rather slow this week and prices without change. We quote, f.o.b. Liverpool:

Staff. Marked Bars	£ s. d. 2 s. d.	8 2 6
Common	6 0 0	
Staff. Bl'k Sheet, singles	7 15 0	
Welsh Bars (f.o.b. Wales)	5 5 0	5 7 6

**Copper.**—Less stock moving, but prices held quite firmly. To-day's prices for Bars were £39. 12/6, spot; £39. 7/6, three months' futures. Best selected, £44. 10/.

**Tin.**—There has been a fairly active business at irregular prices. Straits quoted to-day at £91. 12/6 @ £91. 17/6, spot, and £92. 10/ for three months' futures.

**Lead.**—Business fairly active and prices quite firm. Quoted £12. 15/ for Soft Spanish.

**Spelter.**—There continues to be a brisk demand and prices are strong. Quoted at £18 for ordinary Silesian.

H. H. Mansfield, 36 Pine street, has been appointed agent for New York and vicinity of the Frankford Steel Company, of Philadelphia, for their Steel Forgings, Steel Castings, Tool Steel and other products.

## Foreign Markets.

### EQUIVALENTS.

Franc, Peseta or Lira	Cent.	10.3
Florin (Netherlands)	Cent.	40.2
Florin (Austria)	Cent.	35.9
Wills (Portugal)	Cent.	1.08
Milreis (Brazil)	Cent.	54.6
Mark (Germany)	Cent.	25.6
Picogram	Pounds	2.205
Picul	Pounds	134.

### BRAZIL.

**PARA, May 4, 1889.—India Rubber.**—The season on the Madeira and Cayari rivers is reported to be very healthy, and thus Rubber receipts this year are expected to be exceptionally heavy. The importance of the Rubber trade in Brazil can be judged by remembering that the export of Rubber from this port during the past year amounted to 15,014 tons, of which 8890 went to the United States and 6124 to Europe.—*Diario*.

### EAST INDIES.

**SINGAPORE, April 9, 1889.—Tin.**—Our last report was dated the 26th ult. We have to report a continued scarcity of all our staples, and a very small business in consequence. The market for Tin opened at \$35.75 per picul, but with moderate arrivals it quickly reflected the firmer feeling in London and advanced to \$36.75, at which several transactions have been made. To-day there are buyers, but no sellers, at \$36.12½. The supply during the next six weeks will be on a reduced scale, and it is estimated that the year's production will not be over the average. **Gum Copal.**—A few odd lots have been sold at full prices for low qualities, but the bulk of the arrivals goes to swell the already considerable stock which dealers hold for higher prices. **Tonnage.**—Rates to London by steamer are steady at 40/ @ 45/ for dead weight and light freight respectively. **New York via Cape.**—The Liguri is a full ship and the Edward Kidder only requires a little more light freight to be similarly situated. For Boston the berth is filled by the fixture of the Obed Baxter. The Oanfa, which steamer left hence for New York on March 30, took 1262 piculs of Tin, so that the shipments from the Straits Settlements to the United States to date sum up 31,563 piculs. **Exchange.**—Touched 3/0½ for six months' sight credit drafts, but closes firm at 3/.—*Gilfillan, Wood & Co.*

**MANILA, May 13, 1889.—Hemp.**—There are buyers at \$15.25, against \$8.12½ per picul same date last year, equaling ½ ton, cost and freight, £50, against £27. 10/. Since January 1 there cleared for the United States 105,000 bales, against 71,000 in 1888, while there remain loading 20,000, against 4000. Cleared for Great Britain since January 1, 105,000; loading for do., 4000; cleared for all other ports, 16,000, against 28,000; receipts at all ports since last cable, 2000, against 5000 and since January 1 283,000, against 208,000 in 1888 and 158,000 in 1887. **Freight,** \$7.50, against \$5.50. **Exchange,** six months' sight, 3/6½, against 3/5.—*Ker & Co., to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

**COLOMBO, Ceylon, April 4, 1889.—Plumbago.**—Greater firmness has developed during the week. We quote at the close in rupees per ton: Large lumps, 145 @ 170; ordinary lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Shipments since October 1 have been as follows: To England, 78,162 cwt.; to Hamburg, 5418; to Bremen, 659; to Antwerp, 5101; to Holland, 487; to India, 63; to Australia, 208, and to the United States 76,340—together, 163,388, against 119,125 in 1888, 114,207 in 1887, and 104,504 in 1886. **Cair Yarn** Nos. 1 to 4 remains steady at 7 @ 13 rupees per cwt. **Exchange,** six months' sight, 1/4 11-16.—*Volkart Bros. to their agent in New York, Mr. John W. Greene, 82 Wall street, New York.*

### BELGIUM.

**BRUSSELS, May 8, 1889.—Iron.**—The Chamber of Deputies referred the Pig-Iron duty to the Minister of Finance, who proposes to reduce it one-half, from 5 francs to 2½ francs per ton, and abolish the drawback hitherto allowed Bessemer Pig, of 2½ francs henceforth, also to pay 2½ francs duty. The Chamber will have to decide in the matter. Rolling-mills in the North of France still compete with our's in Belgium for the lack of orders at home. They have reduced working days by half, and Belgian operatives begin to return, as even at lower wages here they do better, work being more than sufficient in our Iron districts. The quotations are for Foundry Pig, 5.10 @ 6.50 francs per 100 kg.; Forge ditto, 4.80 @ 5.80 francs; Merchant, No. 1, 12.50 francs; Beams at Antwerp, 11.75 francs; Angles, 13 francs, and Sheets and Plates, 16 @ 25 francs.—*Moniteur des Interêts Matériels.*

### HOLLAND.

**ROTTERDAM, May 2, 1889.—Tin.**—The 14,000 piculs Billiton offered at auction at Batavia

on April 24 averaged 63.45 guilders per picul, costing to sell here 55.62½ per 50 kg. per steamer. The next sale of a similar quantity will come off toward the end of next month. The following statement shows the position of Banca Tin in Holland on the 30th April from the official returns published by the Dutch Trading Company:

Import in April	Slabs	1889. 14,000	1888. 24,000	1887. 23,790
Total four months		60,973	88,138	65,909
Deliveries in April		17,888	4,500	13,457
Total four months		61,188	26,600	50,488
Stock second hand		23,761	28,955	16,368
Unsold stock		151,235	114,436	75,706
Total stock		175,046	153,391	92,077
Afloat	Piculs	4,300	6,400	4,500

### Statement of Billiton:

Import in April	Slabs	9,550	15,300	5,500
Total 4 months		31,078	41,076	30,374
Deliveries in April		6,885	4,275	7,237
Total 4 months		25,628	16,171	31,062
Stock		25,348	41,088	21,333
Afloat	Piculs	24,500	21,000	16,000

### Quotation 30th April:

Banca	£ 55	£ 70	£ 62
Billiton	£ 54½	£ 65	£ 61½

(De Monchy & Havelaar.)

### GERMANY.

**HAMBURG, May 8, 1889.—Iron.**—Pig-Iron has on the whole continued active in Rhenish Westphalia, including Spiegel for home use, at 66 marks per ton, less so for export. Forge Pig is scarce and wanted at 58; Foundry ditto sustained, Thomas is in lively request at 47, and Bessemer at 58 and even above these figures. English on the West Coast, 50/. Finished Iron is doing well. Southern rolling-mills have raised their price 3 marks per ton for Merchant. Thin Sheets are, however, neglected, and the Wire branch is still repressed, exportation still flagging. The quotation at Dortmund for Wire Rods is 110 @ 120; for Steel Rails, 120 @ 125.—*Borsenhalle.*

### Ore Freights Reduced.

At a meeting of the Pittsburgh agents of the lines controlled by the Pennsylvania Company, the Baltimore and Ohio Railroad, the Pittsburgh and Western Railroad, the New York, Pennsylvania and Ohio Railroad, and the Lake Shore and Michigan Southern Railroad, held in Pittsburgh on Tuesday, the 21st inst., a considerable reduction on freight rates on ore from Lake Erie points was made. We give below the principal points of shipment to which reductions were made, and also the old and new rates. They are as follows:

Point of shipment.	Old rate.	New rate.
Pittsburgh, Allegheny, Chartiers, Beaver Falls, Sharpsburg, Rankin, Bessemer, Munhall, Cochran, Demmeler, McKeesport	\$1.25	\$1.05
Sharpsville, Sharon, New Castle	.72½	.62½
Struthers, Youngstown, Girard, Haseltin, Lowellville, Niles, Johnstown, Conemaugh, Dunbar, Scottsdale, Everson, Oilphant, Uniontown, Fairchance	.72½	.62½
Leechburg, Apollo	1.60	1.34
* Kittanning	1.35	1.22
	1.40	1.40

\* The rate to Kittanning will not be charged for the present.

The above rates are per ton of 2000 pounds, and will go into effect on Tuesday, the 28th inst.

It is stated that the Pennsylvania Railroad Company have decided to make another innovation in their service by placing on the engines a connection with the steam pump, by which a hose can be attached, and in case of fire be of great service. Whenever a smash-up or wreck of passenger cars takes place, especially in the winter, when the car stove is doing its best, a great many lives are lost by fire. The new arrangement, it is hoped, will prevent a great many casualties. A few days ago it was given a test. The apparatus was attached to an ordinary shifting-engine and at a given signal the pump was put in motion. The trial was made at the West Philadelphia yards and the pump had force enough to throw the stream over the highest buildings. It has now been decided to put the apparatus on all the shifting-engines. The hose, which

will be about the length of six cars, will be carried on the tender. It is also proposed to equip the crews of the various trains and train them in the fire drill. If they prove successful a number of the passenger engines will also be equipped.

### The Sweating System in England.

However opinions may differ as to what is termed the "sweating system," few will dispute the value of the inquiry into it, its effects and the remedies by the Lords' committee, appointed at the instance of Lord Dunraven. That committee of inquiry will, at any rate, elicit the facts, and facts must be the basis of legislation if the measures proposed are to be of any service whatever. The sweating system, as practiced more especially in connection with the tailoring trades in the metropolis, was dealt with in a powerful novel by the Rev. Charles Kingsley in 1849, now 40 years ago. From that day to this, says *Engineering*, the evils of the system have been recognized and frequently denounced; but the system has grown; it has extended to many other trades—it is, indeed, almost universal wherever domestic industries are carried on. It is an almost inevitable incident in connection with modes of manufacture carried on under the domestic system at the homes of the producers or in small workshops attached thereto. The factory and workshop acts may and do touch many of those small workshops where children and young persons are employed, but they fail to reach the evil where it is most disastrous, and in cases where adults only are employed they do not touch it at all.

The nail and chain makers of Cradley Heath and its district have suffered and are suffering from many of the evils incident to a domestic industry. Indeed, in some respects there is a concentration of nearly all the evils associated with and arising from this mode of manufacturing. Wages are low; the hours of labor long; women and children are employed to an extent and under conditions which remind us of their employment in mines at the date of the Commission of Inquiry, in 1840-41. And, then, the sanitary condition of the district appears to be almost worse than it was when the sanitary inquiry into the condition of the laboring population was instituted in 1840. A recent witness before the committee stated that the death-rate of children in this district was, in 1888, equal to 10 per 1000, while the general death-rate was 18.2 per 1000. The child mortality is thus considerably over one-half the total death-rate, whereas, taking the whole of England and Wales, it is under one-third. The condition of the dwellings is described as most dilapidated, the sanitary arrangements most defective and the water-supply foully tainted with sewage soil. The whole population is described as "overworked and underfed." Overcrowding is general, decent sleeping accommodation is the exception and utter wretchedness, misery and privation are the usual lot of the people.

Turning to the reports of the commissioners appointed to inquire into the sanitary condition of the laboring population in 1840 we find a similar state of things in connection with the nail-making and cognate trades. The cottages generally consist of one room down-stairs and two up-stairs, with a nail-shop attached. Nailers' children at 10 years of age earn about 2/ per week. The price paid for making nails has been reduced to one-fifth within the last three years, cut nails being now much used. The sanitary condition of the district is described as so bad that a serious outbreak of typhus fever occurred, attributable to want of proper drainage, the filthy habits of the people and the cellar

accommodation. The nailers, it is stated, did not pay much rent, their wages were low and their condition was filthy and ragged in the extreme; the latter fact, it is said, may be attributed to the fact that girls are put to the nail-block before they have learned to sew. The children never went to school, as on week-days the parents could not afford to lose their earnings, and on Sunday they were so ragged that they were ashamed to send them to school. In many instances the whole family, male and female, sleep in one room, of not more than 12 feet square, including father and mother and grown-up sons and daughters, to the number of from seven to nine, and even more, persons. Such was the condition of things in 1840, some 50 years ago; according to recent testimony matters have not materially changed for the better in the nail and chain making districts.

The wail of woe from the Cradley Heath and surrounding districts is no new experience, though it is a sad one. Some 30 years ago a great strike took place in this district, nominally in consequence of an employer insisting upon the workmen making good some damage caused by rattening. But the real cause of the strike and of the rattening was the deductions made from the poor wages of the workpeople, on one pretense and another, then so common in this industry. The strike assumed a demand for an increase of wages. After a prolonged struggle the men obtained a substantial advance in wages, although at great cost, much suffering and after many serious outrages. In 1886 another prolonged struggle took place, when the men regained a trifle of the wages lost during the preceding ten years. At that time the men, women and children were in a state of semi-starvation for nearly six months.

The Duluth *Herald* reports that S. P. Ely, of Cleveland; G. C. Stone, of St. Paul, and others are developing iron-ore property in the mountains on the east coast of Cuba. Breakwaters and harbor works will have to be constructed at a cost ranging between \$750,000 and \$800,000. Stripping is now being carried on, but no ore will be shipped for a year or a year and a half. Analyses show the ore to carry 62 to 66 per cent. of iron, with 0.006 to 0.026 of phosphorus and 0.02 to 0.04 of sulphur. It is estimated that the cost will be \$4.20, f.o.b. ship United States harbors, duty paid.

A vertical wall 100 feet high in St. Louis was thrown 18 inches out of line by a high wind. The building was easily righted by diagonal trussing on the upper floors and the application of jack-screws, while 12 heavy I-beams fastened by channel bars were placed in position in the first floor and basement.

Fully 200 members of the American Society of Mechanical Engineers convened in Erie, Pa., on Tuesday, and heard an address from Hon. Horace See, of Philadelphia, the retiring president. The address was devoted to industrial education.

The new building for the great smelting works at Anaconda, near Butte City, to replace the one recently burnt, will be composed entirely of iron. According to contract with Connecticut men, the material is to be shipped and the building completed in 57 days.

The fourth Ensley Furnace of the Tennessee Coal, Iron and Railroad Company, near Birmingham, Ala., has been recently blown in.

### The Silver Question.

Even the most far-seeing confess themselves beclouded when attempting to predict the future of silver, but somewhere in the distance grave difficulties may be discovered. Shall we have bimetalism or monometallism? Very few of the strenuous advocates of a silver currency have conceded that this question was in any way involved. Their simple demand is give us silver, and without stint. Meanwhile, as the accumulation in the Treasury vaults have increased to enormous proportions, the silver champions have become more outspoken, and it is boldly proclaimed that the gold standard must ultimately be abandoned, in which event "while both metals will continue to be legal measures of value, silver will predominate, and we shall practically have all our assets measured by the silver dollar." This event we are told "is surely coming" under the system of coinage now being pursued, and that the sooner this agony is over the better. This language is none other than that of the veteran financier, John Thompson, of New York, under whose presidency the first national banking institution, under the new law, was organized. It would thus appear to be the avowed purposes of the silver kings like Senator Stewart, of Nevada, to substitute silver for gold and they now feel themselves strongly enough entrenched behind their silver barricade of \$328,000,000, that sum being the total coinage of silver dollars under the act of February 28, 1878, providing for the Bland dollar of 412½ grains. It has taken only about ten years of superabundant silver coinage to reach the point where the country is asked to open the sluice-way and invite the cataclysm. Scarcely was the new Secretary sworn in before Mr. Stewart in the special session of the Senate, presented the following resolution:

*Resolved*, That it is the sense of the Senate that the business of the country requires the purchase by the Secretary of the Treasury of \$4,000,000 worth of silver bullion per month for coinage during the provisions of the act of February 28, 1878.

The grand point made is that the coinage of \$4,000,000 a month would cause such an increased purchase of silver that the depreciation of the market value of the metal would be arrested, bringing the value of 412½ grains of silver bullion nearer to that of 25.8 grains of gold, thus tending speedily to restore the bimetallic standard of gold and silver as it formerly existed. This would be very fine for the constituency represented by Mr. Stewart: "Prior to 1878," Mr. Stewart reminds us, "both gold and silver were available in the hands of the debtor class to meet their obligations." As the Bland dollar can now be manufactured at a cost of about 70 cents each, the scheme has a close resemblance to a fraudulent trick, and it is reasonably assumed that the debtor class—all who have troublesome mortgages and the like—would regard the proposition with extreme favor. Meanwhile, how is the creditor class to be protected? The latter, it should be borne in mind, comprises not only "bloated bondholders," monopolists, owners of real estate, mortgages, &c., but thousands of the industrious poor who have small investments—the savings of a lifetime, and other thousands, comprising widows and orphans depending in like manner upon eventually receiving the full equivalent of a gold dollar. Possibly, however, these latter are of no political importance and not to be regarded. Despite these pessimist observations, however, we may hope the evil day is far off. The disturbing feature in the present circumstances is that the silver-dollar men, quite resigned to the situation, have only to say, "the sooner the better."

# Hardware.

The past week has developed comparatively few changes in price, the market being characterized by a rather weak tone, with a tendency toward lower quotations in several lines. The demand is only moderate, and is limited to assorted lots for immediate requirements. There is some complaint in regard to collections, which are rather sluggish.

## Wire Nails.

A great many Wire Nails were purchased early in the season, and we hear of many instances in which buyers are loaded up with enough of the goods to carry them for some time to come. In this condition of things, as would naturally be expected, the demand is somewhat limited, and comparatively few large orders are being placed. The aggregate of business is, however, referred to as fair. Prices are made on a basis of about \$2.20 to \$2.25, at mill, and small lots from store are sold at the usual advances.

## Barb Wire.

The demand in this market continues good, and some difficulty is experienced in filling orders as promptly as is desirable. Prices are without change on the basis of 3.5 cents for carload lots, 3.6 cents for 3-ton lots and 3.8 cents for small lots, with the usual deliveries.

## Cut Nails.

Lately resales of a block of 10,000 kegs bought from one mill by, another have created irregularity. It is believed that the lot in question is now marketed. We continue to quote \$1.80 to \$1.85 for carload lots in dock for Iron Nails.

## Tackle Blocks.

The manufacturers of Tackle Blocks have united in adopting a revised list, which we print below, this list having gone into effect on the 20th inst. It will be observed that the prices for the regular line of ordinary Mortise Blocks, inside iron strapped, is the same as that published in our issue May 2, the other lists being of subsequent revision, and the whole is now published as the standard list for this line of goods. All the principal makers have united in adopting this revised list, in which the inequalities of the old list are corrected, and the prices made to correspond with the present cost of the goods. The lists, as given below, are subject to the following discounts:

Per cent.

Ordinary Mortise Loose Hooks.....50  
Ordinary Mortise, other than Loose Hooks.....40  
Wide Mortise, 7 to 16 inches inclusive.....40  
Wide Mortise, 18 to 24 inches inclusive.....30  
Galvanizing Straps.....net  
Snatch Blocks, Boston pattern.....40  
Snatch Blocks, other than Boston pattern.....40  
Yacht Blocks.....35

### Composition Self-Lubricating Bushed.

Ordinary Mortise Loose Hooks.....30  
Ordinary Mortise, other than Loose Hooks.....25  
Wide Mortise, 7 to 24 inches inclusive.....30  
Snatch Blocks, Boston pattern.....30  
Snatch Blocks, other than Boston pattern.....30  
Hoisting Blocks, single only.....30  
Add extra for all Loose Swivel Hooks and Swivel Jaws as heretofore.

The following are the revised lists above referred to:

### STANDARD PRICE LIST OF INSIDE IRON-STRAPPED TACKLE BLOCKS, MAY 20, 1889.

#### Iron-Strapped Snatch Blocks. Composition Self-Lubricating Bushed.

Size.	Price.	Size.	Price.
6.....	\$5.25	14.....	\$16.50
7.....	6.00	16.....	22.00
8.....	7.25	18.....	31.00
9.....	8.50	20.....	46.00
10.....	11.00	22.....	68.00
12.....	13.00	24.....	86.00

#### Inside Iron-Strapped Blocks (Ordinary Mortise). With anything except Loose Swivel Hooks and Swivel Jaws.

Size.	Mortise.	Iron Bushed.			Roller Bushed.		
		Single.	Double.	Triple.	Single.	Double.	Triple.
3	9-16	\$0.70	\$1.30	\$1.75	\$1.10	\$2.00	\$2.90
3½	9-16	.75	1.45	2.00	1.15	2.20	3.15
4	11-16	.85	1.60	2.15	1.20	2.25	3.25
5	7/8	.90	1.75	2.25	1.25	2.35	3.50
6	1	1.10	2.00	2.90	1.50	2.85	4.40
7	1½	1.30	2.40	3.50	1.70	3.35	5.00
8	1¾	1.65	2.85	4.25	2.25	4.15	6.00
9	1¾	1.85	3.40	4.75	2.50	4.70	7.25
10	1¾	2.75	4.50	6.25	3.50	6.00	8.50
11	1¾	4.45	7.50	10.65	5.30	9.20	13.20
12	1¾	7.00	10.50	15.00	8.15	12.80	18.45
13	1¾	8.00	13.00	18.00	9.25	15.50	21.75
14	1¾	10.00	15.00	22.00	11.50	18.00	26.50

#### Inside Iron-Strapped Blocks, Wide Mortise and Extra Heavy. With anything except Loose Swivel Hooks.

Size.	Mortise.	Iron Bushed.			Roller Bushed.		
		Single.	Double.	Triple.	Single.	Double.	Triple.
7	1¼	\$2.25	\$4.00	\$5.50	\$3.00	\$5.50	\$7.75
8	1½	2.75	4.50	6.30	3.50	6.00	8.55
9	1½	3.15	5.25	7.35	4.00	6.95	9.80
10	1½	4.10	6.50	8.50	5.25	9.10	12.25
12	1½	5.25	8.50	12.50	6.50	11.00	16.25
14	2	8.00	13.00	17.00	9.75	16.50	22.25
16	2¼	11.50	18.00	28.00	14.00	23.00	35.50
18	2½	15.00	29.00	42.00	18.00	35.00	52.00
20	3	21.00	37.00	54.00	25.00	45.00	65.00
22	3½	26.00	48.00	70.00	.....	.....	.....
24	4	32.00	56.00	84.00	.....	.....	.....

#### Net List for Galvanizing Block Straps.—Price per Each Block.

Size.	Single.	Double.	Triple.
3.....	\$0.04	\$0.06	\$0.10
3½.....	.04	.06	.10
4.....	.05	.07	.11
5.....	.06	.08	.12
6.....	.10	.12	.15
7.....	.12	.15	.18
8.....	.16	.21	.30
9.....	.22	.28	.38
10.....	.28	.38	.50
11.....	.35	.45	.60
12.....	.55	.75	1.00
14.....	.75	.95	1.25
15.....	.85	1.20	1.50

#### Lignum-Vitæ Yacht Blocks, with Galvanized-Iron Straps.

Size.	Plain Galvanized Sheaves.		Roller Bushed Galvanized or Plain Composition Sheaves.		Roller Bushed Composition Sheaves.	
	Single.	Double.	Single.	Double.	Single.	Double.
3.....	\$0.95	\$1.50	\$1.30	\$2.20	\$1.50	\$2.60
3½.....	1.00	1.65	1.40	2.35	1.60	2.75
4.....	1.05	1.75	1.50	2.50	1.75	3.00
4½.....	1.10	1.90	1.60	2.75	1.85	3.25
5.....	1.20	2.00	1.75	3.00	2.10	3.70

#### Inside Iron-Strapped Hoisting Blocks, Stiff Swivel Hooks. Composition Self-Lubricating Bushed.

Size.	Single.	Size.	Single.
10.....	\$6.00	16.....	\$15.00
12.....	8.50	18.....	20.00
14.....	11.00	20.....	25.00
15.....	13.00	.....	.....

#### Snatch Blocks.

Size....	6	7	8	9	10	12	14
Price..	\$0.20	.25	.35	.40	.65	.90	1.20

#### Iron-Strapped Snatch Blocks, Iron Bushed.

Size....	6	7	8	9	10	12
Price...	\$4.00	4.75	5.75	6.75	8.50	10.00
Size....	14	16	18	20	22	24
Price...	\$13.00	17.00	25.00	38.00	55.00	70.00

#### Inside Iron-Strapped Blocks. (Ordinary Mortise.) With anything except Loose Swivel Hooks and Swivel Jaws. Composition Self-Lubricating Bushed.

Size.	Mortise.	Single.	Double.	Triple.
4.....	11-16	\$1.50	\$2.90	\$4.15
5.....	7/8	1.75	3.35	4.75
6.....	1	2.20	4.00	5.80
7.....	1½	2.50	4.50	6.70
8.....	1¾	3.25	5.70	8.50
9.....	1¾	3.70	6.75	10.00
10.....	1¾	4.75	8.50	12.50
11.....	1¾	6.75	12.50	18.50
12.....	1¾	9.75	17.00	25.00
13.....	1¾	11.00	19.50	28.50

#### Inside Iron-Strapped Blocks, Wide Mortise and Extra Heavy, with anything except Loose Swivel Hooks. Composition Self-Lubricating Bushed.

Size.	Mortise.	Single.	Double.	Triple.
7.....	1¼	\$4.50	\$8.00	\$11.50
8.....	1½	5.00	9.00	13.00
9.....	1½	5.75	10.50	15.00
10.....	1½	7.25	13.50	19.00
12.....	1½	9.25	17.00	25.00
14.....	2	13.00	23.50	33.00
16.....	2¼	18.00	32.00	48.00
18.....	2½	23.00	44.00	63.00
20.....	3	32.00	54.00	77.00
22.....	3½	38.00	70.00	100.00
24.....	4	46.00	85.00	125.00

## Miscellaneous Prices.

The Skinner Chuck Company, New Britain, Conn., quote the following prices on their Chucks:

Discount.  
Patent Drill Chucks.....30 %  
Patent Independent Lathe Chucks.....40 %  
Patent Combination Chuck, new model.....40 %

These goods are fully described in their neatly-printed and fully-illustrated catalogue.

Another improvement in the prices of Bright Wire Goods is to be noticed, the goods being now advanced fully 10 per cent. beyond the prices at which they have recently been selling, and are now quoted at discount 87½ per cent. The very low figures at which these goods have been for some time offering justifies this advance, which, we are advised, is made by all the leading manufacturers.

## Export Business.

The condition of the export trade generally may be considered satisfactory in South Africa and the Australian colonies. The situation of the present time is briefly explained. In the former country the success of the diamond mines has greatly stimulated shipments, and a heavy business has been the result. It has the appearance of something better than an unnatural boom. Manifests of vessels clearing for ports in South Africa show large shipments of Lumber, Doors, Sashes, Plows, Edge Tools, Canned Goods, &c., and exporters seem to be satisfied with the present outlook for continued prosperity in that field.

In Australia the business has been heavy during the last two years, perhaps never better, but a relapse has occurred in Victoria and New South Wales owing to poor crops and overloading by importers. Large stocks are now held by all classes of merchants, and they have been curtailing their orders to this country since the 1st of January to a considerable degree. The collapse of the land boom in Melbourne created considerable anxiety for a time, but no failures of consequence, with one exception, are yet reported. New Zealand is at present doing well. Good crops have improved the condition of af-



fairs, and orders from that market have been very satisfactory. Several merchants are at present in this country from the Australian colonies.

Freights have been rather slow on account of slack orders. This, coupled with high rates charged by the freighters, has a tendency to check free buying.

In the Argentine Republic business has been very good. Large shipments of Agricultural Implements and all classes of American Hardware have been made. How long the present good situation will continue is a matter of conjecture. The country has a grand future, and the trade relations with ours should be encouraged rather than rebuffed. This remark, however, may be considered rather ancient, but, as every exporter knows, it applies to almost every country with which we are now doing any business whatever.

### Trade Topics.

Goods exported by American manufacturers are generally satisfactory in quality, manufacturers appreciating the importance of sending out good goods on which reputation can be made in foreign markets, and there is no doubt that the quality and style of American goods exported will compare very favorably with those coming from any other country. Through mistake or otherwise goods of low quality and unsuitable finish may occasionally be exported, but the high character of American manufacturers, as well as their business judgment, makes such instances very rare. We have, however, received from a well-known house in Germany, buying a good many goods in this country, a complaint in regard to the quality of Hickory Handles which have been shipped to them. Omitting the names, what our correspondent says is as follows:

A year ago I bought from — a sample lot of Hickory Handles, first quality. This sample lot was satisfactory in every way, and I was very happy to have a good source of supply for this article, especially as it is my principle to sell only the best which can be secured. My former purchases through Bremen and Hamburg importers were not satisfactory. I was induced through the sample lot purchased to give a larger order. When the goods arrived I found, to my greatest regret, that I had been stuck, since three-fourths of the handles of 30 inches and above, instead of consisting of fine white hard stock furnished in the first lot, were ordinary redwood, which my experience has found break very easily. The result is that I cannot sell these goods at all. As in buying direct American articles in good faith I make immediate payment for them, such a method must be condemned the more. Under these circumstances a demand for damages would be without any result whatever, and therefore, in order to protect honest business men against such practices, I have no other means than to bring the matter before the public in this way, and would request you to print this statement.

The question as to the difference in price of goods to the jobbers and the retail trade is one that is constantly perplexing manufacturers, and on which there is apt to be some divergence of view on the part of those interested. That the same question comes up in Canada is indicated by an article in our esteemed contemporary, *Hardware*, in which it is stated that at a late meeting of the Hardware section of the Toronto Board of Trade a resolution was adopted instructing the secretary to communicate with certain manufacturers named, both of whom are engaged in making Shelf Hardware which is sold largely to retailers, with a view to arranging some better discount for the large trade. The following statement is made in regard to the matter:

Under the existing arrangement one class of retailers is sold to at list prices, and another class at 5 per cent. discount, while the wholesaler only receives 12½ per cent., thus leaving him a margin on the goods he sells of only 7½ per cent. What the wholesalers now want is 15 per cent. discount, and no concession to any class of the retail trade. The question is likely to be pushed by those interested, with what effect remains to be seen.

A good deal of care has to be exercised by manufacturers, or associations of manufacturers, in cases where lower prices are given for export than for domestic trade, as ingenious and unscrupulous buyers will sometimes endeavor to obtain the lower figures for the home market. There have been instances in which goods have been sold to Canadian purchasers at especially low prices, on the ground that entering Canada they have to pay a high duty. The goods thus purchased, however, instead of reaching their destination, have been sent to the purchaser's agent at Suspension Bridge, or else when shipped direct to the Canadian point have not been taken out of bond, but reshipped in bond to Suspension Bridge, and then sold to American merchants. In such a practice only houses without character on either side of the line would participate, but in a number of instances, we regret to say, this scheme has been carried out. In order to guard against it manufacturers in entering into combinations or making any agreement in regard to prices should make combination price apply to Canada as well as this country.

### What the Trade Think of Prices.

An important factor in determining the tone of the market is the opinion of the trade in regard to prices, it being very well known that frequently the trade, more or less generally, are pervaded by a certain confidence that prices are firm and will advance, or at other times become suspicious of prices and regard them as likely to decline. In the one case business is materially stimulated, and in the other it is repressed, the conviction, for which there is often very little ground, tending directly to bring about the condition of things toward which it points. This being the case, it is nearly as important for those who would have light on the business situation to know what the trade think about prices as it is to be advised as to their actual weakness or strength. In expressing their opinion upon trade matters this is a point on which our correspondents often touch, referring sometimes to prices in a particular line, and at others to prices in general. In a number of letters recently received this matter is touched upon many of our correspondents in connection with references to the business situation and other matters related to the trade. These letters represent every section of the country, and are from retail as well as wholesale merchants, whose business varies in extent from that of the village Hardware store to the largest jobbers in the great cities. The opinions expressed, accordingly represent those of the trade at large, so that the manufacturer or merchant may from them receive accurate advices in regard to the feeling of the trade as to prices. It will be seen that many varying opinions are thus expressed, and it is interesting to note the different ways in which the trade regard the matter.

*Michigan*.—Prices as they are ranging at present are good, and if maintained will afford a good per cent. profit.

*Connecticut*.—The general tone of the market is, we think, for lower prices. Competition and the bringing together of the manufacturer and consumer are gradually reducing prices.

*Maine*.—The general tone of the market is good, and there is little cutting in prices. Goods generally are being sold at small advance from cost.

*New York*.—Prices are low and going lower every week. Bottom has not been touched yet, and don't know as it ever will be. General market is lower than ever known in Hardware.

*Michigan*.—The tendency is downward. There is a general feeling that goods must be sold very close, and, by the way, they are down to rock bottom.

*Iowa*.—Prices are unsteady, with a tendency to cut on leading lines.

*Wisconsin*.—The general tone of prices is healthy, as all parties are satisfied that we are at the bottom.

*Pennsylvania*.—There is a disposition on the part of a few (as there always is) to disturb matters by some extremely low prices. No more so than usual, however.

*Tennessee*.—Prices have been low, but sales have more than made up the difference in prices.

*Alabama*.—The disposition is to obtain a fair margin in profits, but this depends upon the desire of competing points to cut, which, we regret to say, is very frequently done.

*Iowa*.—The feeling is that prices will soon take an upward turn.

*Kansas*.—Prices are low. Some jobbers are cutting for trade.

*Connecticut*.—There seems to be no confidence that prices will be any higher. The tendency seems to be downward on nearly all Hardware lines, and in buying we do not know but we are paying more than a neighbor.

*Michigan*.—Good buyers can almost make their own prices, and stocks are, therefore, well up.

*Ohio*.—Goods are too cheap. Deception is practiced all along the line.

*Ohio*.—Outside of Screws and a very few other articles there seems to be no effort made to advance prices. On the contrary, there is a downward tendency in several lines.

*Connecticut*.—Dealers want lower and lower prices, until with competition there is nothing left to manufacturer.

*Michigan*.—We have been looking for advances in some lines of heavy goods, but think now there is not much prospect of same before July or August.

*Indiana*.—There has been some cutting in prices by those anxious to reduce stock, but generally prices have been fairly maintained.

*Maine*.—Everybody seems anxious to get a better profit than last year, and is holding his goods rather than give them away.

*Kentucky*.—The market is dragging singularly, in view of the volume of business being done.

*Rhode Island*.—Prices have been much cut up since January 1. Unusual anxiety to sell noticed on part of manufacturers and jobbers.

*Vermont*.—Almost every article we buy shows a weak market with downward tendency.

*Indiana*.—Competition keener than ever, and consequently profits are very small. Prices have a downward tendency.

*Iowa*.—General tone of the market is downward on Hardware and Iron Goods. Iron and Steel Goods certainly as low, if not lower, than they should be, but supply as yet seems to exceed demand, and supply and demand always have and always will regulate prices.

*Massachusetts*.—We manage to sell close and make up in volume of business instead of getting high prices.

*South Carolina*.—We are being forced to sell goods at retail at a very small margin, though there is a growing demand for the better class of goods.

*Minnesota*.—Prices have been thus far much depressed. Salesmen are inclined to cut, thinking that demand will improve after season has fairly opened.

*Wisconsin*.—Prices are low. All goods, owing to excessive competition and close proximity of large towns, are sold at small margins. Chicago and Milwaukee jobbers solicit builders' business.

*Iowa*.—There is a very general feeling that prices are already as low as they can go, but at the same time there is very little confidence in prices of Hardware advancing in the near future.

*Illinois*.—Staples are sold on as close margins as we have ever known, but the profit on other goods is better than usual.

*Alabama*.—Prices are cut to the smallest margin possible.

*Iowa*.—All being eager to do business, profits are often foregone. This is the most unfavorable feature of the Hardware business.

*California*.—There has been considerable of a decrease in prices, but at present the tendency is toward a slight advance.

*Missouri*.—Large stocks of Hardware, bought in prospect of a fair demand, have induced low prices on a majority of articles. Cash has it all its own way.

*Tennessee*.—Prices are low and irregular. Heavy goods appear to be weakening.

*Massachusetts*.—Competition by manufacturers has caused some feeling. As soon as a party has purchased some one comes along and offers similar goods at a lower price.

*Pennsylvania*.—General tone is steady, but a little weakening in a few items. Most goods seem to be pretty close to cost.

*Iowa*.—Manufacturers and jobbers are all anxious to sell, but there is not much cutting on prices.

*Illinois*.—Prices are satisfactory with the exception of some articles controlled by combination—viz.: Screws, Bolts and Copper Goods.

*West Virginia*.—Prices are very weak. Little confidence as to the bottom. A gradual growth of skepticism in that direction.



**New York.**—At present we can see little encouragement to hope for higher prices, while in staple Iron Goods the prospect is not upward by any means.

**Minnesota.**—Prices are weak. Most any reasonable concession given if it will effect a sale. This results apparently not so much from competition as from fear of a break in prices, or more that a more limited demand than usual will leave them overstocked on goods limited to season.

**Ohio.**—Prices are being held up closer than for some time by both jobbers and makers of goods, with the exception of some few leading articles, such as Nails, Strap and T Hinges, Wire, &c.

**Kansas.**—Prices on staple Hardware are tending lower, small trade seeming to cause lower prices.

**Minnesota.**—Prices in most lines are well maintained, but there is no sign of firmness except in Nails, Barb Wire and Wagon and Carriage Wood stock.

**Wisconsin.**—Most stable articles are lower than ever known before. This is especially true of Iron and Nails and Barb Wire.

**New York.**—The general tone of the market, we think, is depressed. It would be hard to make sales at advanced prices.

**Minnesota.**—Prices are steady, and there is a hopeful feeling that they have reached bottom, and that we are on the eve of more prosperous times.

**West Virginia.**—Prices are lower than they were at this time last year, though advances lately made are firmly held and show no tendency to cut.

**Kansas.**—Prices are lower than ever known in the retail trade here.

**Indiana.**—Very few lines of goods are held firm. We think there is a greater effort made in allowing "special concessions" to move goods than at any time for many years. Quantity secures low prices.

**Maryland.**—We can hardly believe it possible for lower figures to be reached than now prevail, except it be with such goods as are held in combination or pools.

**Illinois.**—Prices are too weak. Margins too close for size of trade. Profits are given to the class that does not appreciate them.

**Kansas.**—While prices are not demoralized, good values can be got of reliable houses. Desirable customers are no doubt able to get goods under the general market.

**Nebraska.**—Locally there is no indication of demoralization in prices. The breaking down in prices usually follows overstocking of manufacturers or dealers.

**Nebraska.**—Prices as a rule are holding their own. Changes are few and nominal and usually in the direction of lower prices.

**New York.**—On many heavy and leading goods sold largely at this season prices are very low, and the general tone of the market indicates that values will rule low this year; hence, buyers are not anticipating their wants as much as heretofore by placing orders in advance.

**Dakota.**—Prices are not as good as usual. Merchants are so anxious to sell that many cut the bottom out of prices.

**North Carolina.**—Prices are very close. Margins are small on leading goods.

**Missouri.**—The tone of the market as regards prices is very discouraging, but as it has been getting worse from year to year for a long time we have almost ceased to grumble.

**Florida.**—Prices have been very good, but there has been some cutting on staple goods.

**Colorado.**—Have looked for prices to advance, but have now no faith in same.

**California.**—Prices are very low, Eastern competition being such that goods are sold at close margin by jobbers.

**Colorado.**—Some dealers being overstocked on Barb Wire, Nails and other heavy goods are cutting prices for cash sales, though prices in general are moderately firm.

**Maine.**—Prices are a good deal cut up, and the lower they go the harder it is to sell at fair profits. We regard prices as unsatisfactory on the whole.

**Illinois.**—Prices are at present weak, but think we can see indications of its bettering before fall.

**Pennsylvania.**—Prices are low, low, very low. We believe a little firmness in price would encourage everybody, manufacturers as well as dealers, and would stimulate trade now only waiting for some impetus of the kind.

**Iowa.**—Prices are very low and we see no prospect for any advances. We notice jobbers' prices on the Mississippi River are very nearly the same as New York jobbers' prices, especially on staple goods.

#### Items.

The strength of the eight-hour day movement is shown by the adoption by the Illinois Legislature of an amendment to the ship-canal bill, making eight hours a day's work in the construction of the proposed

water-way between Lake Michigan and the Mississippi River. The amendment was adopted in the State Senate by an overwhelming vote, only two names being recorded in opposition to it. It seems to be the purpose of the labor leaders to compel in every way the recognition of eight hours as a legal day's work. In the city of Chicago eight hours has constituted a day's work on all public work for some time past by ordinance of the City Council.

The well-known Chicago Hardware House of Kellogg, Johnson & Bliss has undergone a reorganization during the past week. Messrs. Kellogg & Johnson have retired from the company, and their stock has been transferred to Bullard & Gormley, who have for several years past conducted a Hardware store at 106 Lake street. The stock of Bullard & Gormley will be removed to Kellogg, Johnson & Bliss' store, at 108 and 110 Randolph street. The corporate name will be retained by the new company for the present, with Bliss, Bullard & Gormley as managers. This is a very important consolidation of Hardware interests in Chicago, as these two houses have been competing with each other in precisely the same line of trade—namely, Builders' Hardware and Mechanics' Tools. They, of course, carried a general line of Hardware, but made a specialty of the branches mentioned. The stock of the new house will be very large, and will probably exceed that of any other retail Hardware house in the West.

The leading Hardware and Iron and Steel houses of Chicago will, as usual, close their places of business at 1 o'clock on Saturday hereafter until August 31. The Saturday half-holiday during the summer now seems to have established itself as a permanent institution among the business houses of that city.

Announcement is made by the Cleveland City Forge and Iron Company, the Avery Stamping Company, the Chapman Jack Company and the Bronson Supply Company, all of Cleveland, Ohio, that owing to the large extension of their business in the South they have established a special agency for the South for their different lines of goods in the Neal Building, Baltimore, Md., with Alfred Ely as manager.

Lake Erie Iron Company, Cleveland, Ohio, have made an arrangement with Surpluss, Dunn & Alder, 97 Chambers street, New York, by which they will represent their interests in the East and South, and will solicit orders on their account, quoting as low prices as the home office. The Iowa Barb Wire Company also have appointed Surpluss, Dunn & Alder, 97 Chambers street, New York, their agents for Southern and export trade.

Simmons Hardware Company, St. Louis, Mo., have purchased the stock and good-will of Caruth & Byrnes Hardware Company, of the same city. The negotiations for the sale have been carried on for some time past, but in such a quiet manner that the announcement was a complete surprise to the trade. The transfer was made on Monday, the 20th inst.

Thomas S. Krall, Lebanon, Pa., has invented and is about to manufacture a Spring to be put on a single-tree, so that the trace cannot slip off. It is a contrivance made of spring brass wire, the two arms of which are inserted in the hole in the single-tree, making a simple and apparently secure contrivance for the purpose indicated. Two patterns of this Spring are made. When desired the Spring may be attached to the single-tree by a small chain, or its form is such as to permit its being easily carried in the pocket.

The decision of the Circuit Court of the United States, Eastern District of Pennsylvania, in the case against Paine, Diehl & Co., for infringements of the patents on

the Henis Fruit and Vegetable Press, owned by the C. F. Henis Company, is to the effect that the defendants have violated and infringed the first and third claims of the patent, and an injunction is granted against making, using or selling the goods thus infringing. The amount of damages sustained is left to the decision of a referee.

C. J. Bailey & Co., 132 Pearl street, Boston, Mass., whose Rubber Dauber is described on page 791, issue circulars describing a variety of Rubber Brushes, including Bath, Flesh-Tooth and Hand Brushes, &c., Pen-Holders, Pant Guards, Erasers and other goods, all of which are more or less closely constructed on the same principle as the Dauber.

The trade will note with interest the advertisement of the Shepard Hardware Company, Buffalo, N. Y., in which the merits of their Lightning Freezers are enumerated with a unique setting.

Wells Bros. & Co., Greenfield, Mass., advise us that they have accepted the exclusive sale of the well-known Stratton Bros. Improved Spirit Levels. These Levels have been on the market for more than 20 years, and are referred to as occupying a high place. Catalogues and quotations will be furnished the trade upon application to Wells Bros. & Co.

O. W. Graves, 19 Cliff street, New York, agent for the American Brass Kettle manufacturers, issues a circular in which the new line of Tinned Inside Kettles, to which we referred in our last issue, are represented, specific information being given of the sizes, weight and capacity. The regular goods are also similarly described.

We are informed that W. G. Avery, president of the W. G. Avery Mfg. Company, Cleveland, Ohio, and inventor of the Seamless Elevator Buckets and Troughs, contemplates soon putting on the market his new Cattle and Horse Troughs. These Troughs are referred to as a decided improvement over the ordinary ones now in use, and are claimed to be equal, if not superior, to the seamless ones.

Columbiana Pump and Machine Company, Columbiana, Ohio, have issued a comprehensive and convenient catalogue, which represents their large and increasing line of Force and Lift Pumps, as well as other specialties of their manufacture. In their opening circular they refer gracefully to the patronage they have received, and allude also to the quality of their goods and their purpose to incorporate improvements from time to time. Very satisfactory descriptions are given of the different Pumps, with list prices and other information which will be of service to the trade.

Wire Goods Company, Worcester, Mass., issue new pages for their catalogue describing recent additions to their line, including Dog and Halter Chains, Handled Pot Chains, Cake Coolers, Portable Pie Rack, Fishing Hook Attachments, Hooks of different kinds and the patent Take-up Twine-Box.

R. Wallace & Sons Mfg. Company, with factories at Wallingford, Conn., have established a salesroom at 104 State street, Chicago, Ill., under the management of O. F. Bridges. They will carry a complete line of the company's goods, adding frequently the latest productions in Silver and other metals, so that their stock will represent the most recent and artistic efforts in this line.

Cordley & Hayes, 173 Duane street, New York, agents for the sale of Monroe Bros' Refrigerators, state that the fire at the factory last week damaged only the wood-working department, the total loss being estimated at \$20,000. Their stock of Refrigerators and a lot coming through were

not injured, so that they are able to fill orders promptly. On two or three sizes they were low, but have arranged for the cabinet-work to be made for them, and hope to be able to meet all demands. The sale on these goods this season is referred to as beyond expectations, and they are said to be meeting with favor among the best trade.

The American Oil Stove Company, Gardner, Mass., issue a catalogue for 1889, which they claim illustrates a still better and more complete line of Oil Stoves and Lamps than that of 1888. The company state that for a number of years past they have felt the need of better distributing facilities, and announce to the New England trade that they have opened an office at 9 Broomfield street, Boston, where they will carry a full stock of Stoves. The catalogue consists of something over 30 pages of letter-press, profusely illustrated with their leading specialties. Among the latter we find what the company are pleased to term a Lamp Stove Range. It presents very much the appearance of a Vapor Stove, but is made up of a number of Lamp Stoves placed upon a frame in such a way that their tops practically coincide with what would be the top surface of a Vapor Stove. The range is made in sections about 12 inches square, is provided with castors and finished in japan and nickel.

### Important Business Changes.

The Trenton Vise and Tool Works, for the past 30 years established in Trenton, N. J., and owned solely by Hermann Boker & Co., of New York, has been organized as a stock company. Herman Funke, Sr., of Hermann Boker & Co., New York, is president, and David W. Van Tine, of G. W. Van Tine & Son, of Philadelphia, is secretary and treasurer. During the past three weeks the works have been closed, in order that extensive alterations and improvements, made necessary by largely-increased business, might be made. These changes are now completed, and the new company assure their friends that they will soon be able to execute all orders with prompt dispatch. The special products of this company are Solid Box Vises, all kinds of Parallel Swivel and Coach Vises, Picks, Mattocks, Hoes, Hammers, Sledges, Tongs, Pincers, and similar goods, which have quite an extended reputation for superior excellence, and the new management advise us that they propose to keep up the high standard already attained, and if possible to improve it. The Trenton Vise and Tool Works emphasise the quality of their Solid Box Vises, and say that no effort will be spared to maintain the high reputation that their goods have enjoyed for a quarter of a century. As heretofore, the sale of the product of this company will be through Hermann Boker & Co., of New York, and G. W. Van Tine & Son, of Philadelphia.

An important change has taken place in the John Russell Cutlery Company, Turners Falls, Mass. Richard N. Oakman, Jr., who for the past 15 years has been treasurer and manager of the company, has disposed of his stock to W. P. Dustin and will retire from the management at the annual meeting in July. It is understood that for the present, at least, Mr. Oakman will continue manager of the Lamson & Goodnow Mfg. Company, Shelburne Falls. His management of the John Russell Cutlery Company is generally regarded as having been exceptionally skillful and successful. This change, together with that noted below in the firm of Landers, Frary & Clark, is not regarded as likely to result in weakening the arrangement between the manufacturers, but is interpreted generally as likely

to tend toward the continuance and strengthening of the close relations already existing. Mr. Dustin, of the John Russell Cutlery Company, and Mr. Landers, of Landers, Frary & Clark, while sharp competitors, understand thoroughly the art of pulling together when desired, and any demoralization of prices is not anticipated. The understanding which has existed among the manufacturers is regarded by the trade as desirable, as by it prices, while kept above the unprofitable level to which they fell during the intense and unrestrained competition, are also kept at a moderate figure and not unreasonably high.

At a meeting of the Board of Directors of Landers, Frary & Clark, New Britain, Conn., held on May 6, J. A. Pickett, who has been president of the company since the retirement of J. D. Frary, in 1875, tendered his resignation, which was accepted, and Hon. Francis B. Cooley, of Hartford, was chosen president for the unexpired term.

### Exports.

PER BRIG RAPID, MAY 8, 1889, FOR PORT NATAL, SOUTH AFRICA.

By *Arkell & Douglas*.—6 crates Stoves, 2 cases Nails, 1 crate Handles, 6 cases Hardware, 13 bundles Wash-Boards, 6 dozen Tools, 15 cases Plows, 1 case Brooms, 6 cases Plows, 6 cases Agricultural Implements, 12 dozen Handles, 20 boxes Clothes-Pins, 1 case Brooms, 12 cases Agricultural Implements, 1/2 dozen Wringers, 4 crates Ranges, 4 cases Stove-Ware, 14 cases Tools, 8 dozen Saws, 6 dozen Hammers, 8 dozen Shelf Brackets, 6 crates Sad-Irons, 5 cases Hardware, 10 boxes Shade Rollers, 25 cases Plows.

FOR EAST LONDON.

By *Arkell & Douglas*.—12 cases Scales, 1 case Blacking, 1 case Hardware, 4 cases Miter Boxes, 1 case Razors, 1 case Hardware, 1 keg Braces, 295 kegs Nails, 84 cases Agricultural Implements, 13 cases Axes, 2 cases Brooms, 1 bundle Sash Cord, 6500 pounds Sash Weights, 13 packages Lamp Goods.

PER SHIP GRANITE STATE, MAY 11, 1889, FOR SYDNEY, N. S. W.

By *Simpson, Hall, Miller & Co.*—6 cases Silver-Plated Ware.

By *H. S. Chipman*.—1 crate Churns, 1 Stepladder.

By *E. K. Alburdis*.—10 gross Blacking, 1 case Hardware.

By *McCoy & Sanders*.—84 dozen Handles, 1 Planer, 1 Cutting Machine.

By *Healy & Earl*.—4 boxes Sawmills, 2 Stationary Engines, 6 boxes Steam Pumps, 4 cases Saws, 1 case Wood-Working Machinery, 2 packages Die Plates.

By *Coombs, Crosby & Eddy*.—1318 Blocks, 500 pieces Tin-Ware, 1/2 gross Traps, 2 dozen Lamp Goods, 5 dozen Axes, 20 gross Blacking, 126 Velocipedes.

By *Ilseley, Doubleday & Co.*—12 1/2 gross Axes, 12 1/2 gross Axle Grease, 7 1/2 gross Axle Grease, 224 pounds Glue, 6 1/2 gross Axle Grease, 16 dozen Horse Brushes, 8 dozen Hardware, 5 gross Glass Cutters.

By *Strong & Trowbridge*.—2 packages Carpenters' Tools, 12 cases Axes, 3 cases Hatchets, 66,000 Cartridges and Primers, 3 cases Rifles, 3 packages Grindstone Parts, 2 cases Plated-Ware, 1 case Tin-Ware, 1 case Wire Goods, 1 case Tools, 13 crates Barrow Parts, 2 cases Corn Mills, 5 cases Handles, 5 cases Carpenters' Tools, 1 case Tinner's Tools, 1 case Hardware, 1 case Screw-Drivers, 10 packages Pumps, 2 cases Broom Handles, 4 cases Bolts, 1 case Rakes, 1 case Tools.

By *Morris, Strouse & Co.*—24 dozen Oil Cans, 2 dozen Hat-Racks, 250 cases Clothes-Pins, 200 cases Clothes-Pins, 28 dozen Carpenters' Tools, 1/2 dozen Sad-Irons, 22 dozen Knives, 7 dozen Coopers' Tools, 25 dozen Saws, 190 pounds Oil-Stone, 20 dozen Hammers.

By *McLean Bros. & Rigg*.—3 Miter Boxes, 12 Scales, 10 Pumps, 12 Gate Latches, 4 cases Wire Goods, 24 sets Axes, 6 dozen Oilers, 12 dozen Handles, 2 dozen Cork Pullers, 3 dozen Braces, 6 dozen Augers, 18 dozen Hoes, 12 dozen Parers and Corers, 30 bundles Carriage-Ware, 20 dozen Axes, 6 cases Agate-Ware, 6 dozen Bird Cages, 36 dozen Lemon-Squeezers, 24 dozen Curry-Combs, 66 dozen Handles, 56 Ice-Cream Freezers, 1 case Agate-Ware, 30 Refrigerators, 19 Pumps, 60 Ladders, 26 dozen Locks, 20,000 Cartridges, 12 dozen Hammers, 9 cases Fire-Arms, 18 Wringers, 4 1/2 dozen Meat-Choppers, 3 cases Wire Goods, 20,000 Bolts, 3 dozen Miter-Boxes, 2 dozen Lanterns.

By *Rogers, Smith & Co*.—9 packages Plated-Ware.

By *Lazarus & Rosenfeld*.—120 dozen Axe-Handles, 38 dozen Handles.

By *W. K. Freeman*.—18 Rifles, 4000 Cartridges, 12 sets Tools.

By *Nevius & Haviland*.—23 cases Spring Shade Rollers.

By *Welsh & Lea*.—8 cases Iron Bolts.

By *Manhattan Brass Company*.—9 cases Burners.

By *E. K. Alburdis*.—37 pairs Springs, 20 pairs Rims.

By *F. B. Wheeler & Co.*.—5 cases Hardware.

By *W. & B. Douglas*.—101 Pumps.

By *Bradley & Hubbard Mfg. Company*.—20 packages Lamp Goods.

By *Waterbury Clock Company*.—21 boxes Clocks, 15 cases Clocks, 13 cases Clocks.

By *B. F. Avery & Sons*.—2910 pounds Flow Parts.

By *Ansonia Clock Company*.—25 boxes Clocks, 19 boxes Clocks.

By *Edward Miller & Co.*.—16 packages Lamp Goods.

By *A. S. Lascelles & Co.*.—1 case Wrenches.

By *H. W. Peabody & Co.*.—59 dozen Wash-Boards, 24 dozen Brooms, 34 dozen Handles, 12 dozen Handles.

By *R. W. Forbes & Son*.—2 packages Agricultural Implements, 38 packages Wagons and Parts, 96 packages Sewing-Machines, 3 cases Pumps.

By *A. Field & Co.*.—10 dozen Axes, 8 dozen Tools, 10 dozen Hammers, 2 dozen Tools, 12 dozen Handles, 25 boxes Clothes-Pins, 6 dozen Washboards, 120 dozen handles, 6 dozen Harness-Ware, 12 dozen Rat Traps, 3 cases Harness-Ware.

By *V. Basanta*.—9 dozen Sieves, 21 dozen Thermometers, 9 sets Saddlery, 62 dozen Handles, 30 dozen Wrenches, 100 gross Paper Caps, 3 gross Toy Pistols.

By *Arkell & Douglas*.—80 dozen Tools, 1 case Brooms, 24 boxes Fruit Jars, 1 case Tin-ware, 17 boxes Tools, 2 cases Handles, 18 cases Edge Tools, 9 cases Chimneys, 1 case Traps, 10 cases Axes, 24 cases Carriage-ware, 55 bundles Rims, 10 bundles Shellers, 12 cases Bolts, 43 cases Edge Tools, 1 case Saw Sets.

By *Arnold, Cheny & Co.*.—1 barrel Twine, 5 cases Plows, 8 cases Brooms, 105 cases Handles, 2 cases Wagons, 1 case Gearing and Wheels, 1 case Buckboards, 1 case Harness, 6 cases Carriage Hardware, 91,791 pieces Roofing Slate, 5 cases Axes, 1 case Saddlery Hardware, 21 packages Carriage-Ware.

By *W. H. Crossman & Bro.*.—54 dozen Handles, 6 dozen Lemon Squeezers, 12 dozen Lemon Squeezers, 5 dozen Bush Hooks, 6 dozen Grindstone Fixtures, 24 dozen Mouse-Traps, 14 cases Hardware, 10 Rifles, 40 sets Tools, 50,000 Primers, 12,000 Metallic Cartridges, 1000 Handles, 1/2 dozen Bells, 7 cases Hardware, 25 dozen Axes, 33 dozen Brushes, 5 cases Hardware, 5 cases Hardware, 1 dozen Vises, 1310 pounds Iron Bolts, 80 dozen Handles, 1000 Handles, 5 dozen Iron Rails, 36 dozen Mouse Traps, 2 cases Hardware, 6 dozen Wringers, 2 1/2 dozen Corn Mills, 60 dozen Fruit Jars, 100 dozen Polish, 24 dozen Cotton Hooks, 24 dozen Lemon Squeezers, 3 dozen Carpet Sweepers, 84 dozen Fruit Jars, 1/2 dozen Tobacco Cutters, 1 case Hardware, 1 case Plow Parts, 25 Clocks 2 dozen Meat Choppers, 400 pounds Nails, 4 dozen Hammers, 1 box Hardware, 1 case Hardware, 1 case Hardware, 20 Handles, 1 gross Brushes, 2000 Handles, 5 cases Metallic Cartridges, 1 1/2 dozen Lawn Mowers, 21 cases Fruit Jars, 3 cases Hardware, 18 dozen Locks, 10 Pistols, 5 cases Carriage-Ware, 46 bundles Carriage-Ware.

PER BARK NANNY, MAY 13, 1889, FOR DUNEDIN, NEW ZEALAND.

By *Welsh & Lea*.—5 cases Saws.

By *Edward Miller & Co.*.—14 packages Lamp Goods, 11 packages Lamp Goods, 6 packages Lamp Goods, 50 packages Lamp Goods.

By *R. W. Forbes & Son*.—3 packages Hardware, 1 box Toy Banks, 10 dozen Snaths, 10 dozen Hay Rakes, 6 packages Churns, 33 dozen Tool Handles, 4 dozen Hatchets, 27 dozen Fork Handles, 3 dozen Manure Forks, 1 dozen Wringers, 11 cases Meat Choppers, 11,310 pounds Barb Wire, 120 dozen Axe Handles.

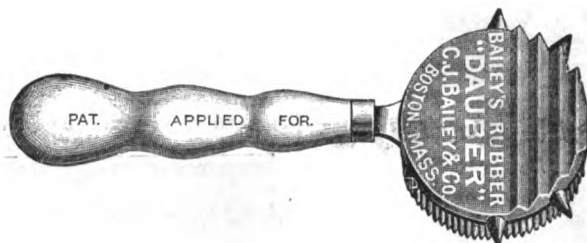
By *Chas. Brewer & Co.*.—16 cases Handles, 13 cases Tools, 9 cases Agricultural Implements, 12 cases Hardware, 2800 pounds Horse Nails, 1 bale Rubber, 2 cases Clocks, 2 packages Lamp-Ware, 4 cases and 11 kegs Axle Grease, 24 bundles Wash Boards, 3 1/2 barrels and 16 kegs Axle Grease, 10 crates Stoves.

By *H. W. Peabody & Co.*.—201 packages Agricultural Machines, 2 packages Hardware, 1 case Lamp-Ware, 2 bales Hammocks, 9 cases Hardware, 7 cases Axes and Springs, 18 packages Carriage-Ware, 1 case Plated-Ware, 2 cases Bolts and Nuts, 12 packages Hardware, 2 cases Pumps, 84 dozen Handles, 1 case Stone, 6 cases Hardware, 3 cases Wringers, 2 dozen Agricultural Implements, 7 packages Lawn Mowers, 1 case Stamped-Ware.

**A Rubber Dauber.**

C. J. Bailey & Co., Boston, Mass., are manufacturing a dauber which is quite different from those with which the trade are familiar. It is represented in the illustration herewith given. The head is made of rubber, including the part by which the

direct special attention is the mechanism for releasing the sash after it has been automatically locked in place. The spindle of the knob is pivoted at its upper end in such a manner as to allow of a little play within the knob. The opposite end of the spindle is bifurcated for the purpose of receiving the flat bar which actuates the

*A Rubber Dauber.*

blackening is applied, which consists of a large number of rubber bristles or points  $\frac{1}{8}$  inch long, constituting a soft, elastic surface, which seems well adapted for the purpose intended. On the edge are projecting spurs for removing the mud, and on the back there are ribs for the same purpose. The head is mounted on brass, by which also it is connected with the handle, which has a brass ferrule. The points made by the manufacturers in regard to this dauber are that it will not clog nor spatter, and that the blackening can be applied accurately, so that in use on a

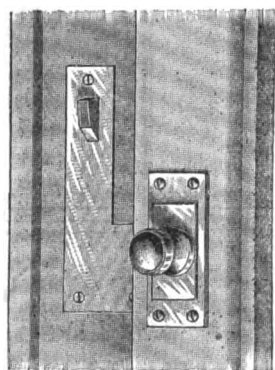
lock shown in the sash groove at the right of the cut. When the device is operated, it is only necessary to move the thumb-nut upward, which gives to the flat bar above referred to a rocking motion, causing the bolt to be depressed, releasing the window sash. The construction is such that the device locks automatically, and when the window is once secured in place it cannot be opened except from the inside. The lock is made in three sizes, the smallest being intended for ordinary windows and dumb-waiter doors. It is carefully constructed of brass, and during the period it

*Dixon's Metal-Workers' Crayon.*

low shoe or a gaiter boot the blackening can be put on without soiling the stocking or the cloth top. It is neatly made and retails for 25 cents.

**Single Sash Lock and Ventilator.**

Some time since we presented to our readers several views of a sash lock and ventilator designed to work in connection with a double sash and to hold either or both in any position desired. The very common practice of constructing modern

*Single Sash Lock and Ventilator.*

buildings, however, with one large sash instead of two has induced the manufacturers, Jenkins & Timby, Oswego, N. Y., and 102 Chambers street, New York City, to put upon the market a sash lock and ventilator specially intended to meet this requirement. In the engraving presented herewith we show a section of window frame with the lock attached, an inspection of which will show its general arrangement. One of the peculiar features of construction to which the manufacturers

has been before the trade, met with a gratifying reception.

**Dixon's Metal-Worker's Crayon.**

Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Reade street, New York, are putting on the market a soapstone crayon for marking metals, which is illustrated above. This crayon is sawed out of solid soapstone, which is referred to as especially adapted for marking on all dark-colored metals. It is covered with paper lettered as shown in the cut, which represents the crayon full size.

One of the immediate effects of the completion of the Poughkeepsie bridge will be to divert a large share of the coal trade which passes through Philadelphia over the Reading to New England from Port Richmond. It is expected that all of the coal for points in New England not on the seacoast will of necessity go over the bridge by the all-rail route it affords. Within two years it is expected that a road to connect with the bridge system will be built from Slatington across to Harrisburg. This would be practically the completion of the dream of the life of the late Edgar Thomson, president of the Pennsylvania Railroad Company—an air line from the West to Boston. The managers of the bridge system expect that 3,000,000 tons of coal will pass over their line annually, and arrangements have already been completed with nearly all the coal roads for a direct connection.

The contract for the Philadelphia and Reading Railroad's new iron bridge across the Schuylkill River below Manayunk has been given to the Pencoyd Iron Works. The bridge will be about 600 feet long.

**Chicago Incased Screen-Door Hinge.**

The Chicago Spring Butt Company, Union and Lake streets, Chicago, have brought out a new hinge for screen doors. It has an incased spring. The accompanying illustration shows a face of the spring-hinge and a blank hinge which goes with it, the two constituting a pair of hinges. This hinge has a powerful spring, from the fact that the spring or power is attached to one hinge-leaf and an extended bearing-

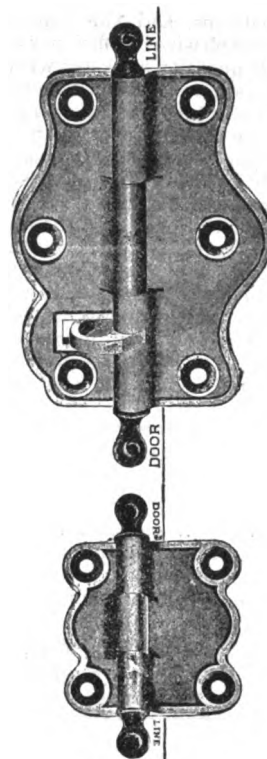
*Fig. 1.—Chicago Incased Hold-Back Screen Door Spring Hinge.*

plate or lever to the other leaf. As the hinge is closed the spring itself travels toward the outer end of the bearing-plate or lever, increasing its power to operate the door many times over a hinge with a stationary spring and a long arm reaching to the end of the lever or bearing-

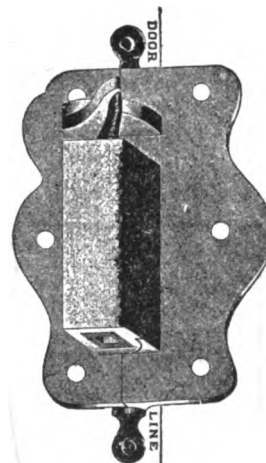
*Fig. 2.—Back of Hinge.*

plate. The illustration above is a back view of the spring-hinge showing the case for the spring. As most screen doors are hung direct to the casing with no intermediate strips, this hinge is made so that it can be applied by cutting a notch from the door only. It has a plain surface, which can be polished in bronze metal or iron and plated for fine screen doors.

### Cyclone Tank Lift-Pump.

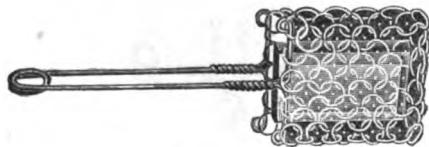
This pump is represented in the accompanying illustration, and is manufactured by F. E. Myers & Bro., Ashland, Ohio. Its construction embodies new and im-

proved patterns, and the manufacturers especially emphasize its efficiency in throwing a large quantity of water with a small amount of power. It has a 4-inch cylinder in which two plungers are operated, thus giving it the capacity of two single-acting 4-inch cylinder pumps. It has but one check-valve. It is designed especially for filling threshermen's tanks, the pump being permanently located on the tank and a piece of hose attached to it and connected with the stream or well from which the water is to be obtained. The manufacturers state that the pump has been thoroughly tested, and is fully guaranteed in every particular. The capacity of the pump is referred to as one barrel per minute.

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### Soap-Shaker.

The Hamblin & Russell Mfg. Company, Worcester, Mass., are manufacturing the soap-shaker shown in the accompanying illustration. It will be understood that the piece of soap is to be inserted in this



Soap Shaker.

wire bag or pocket, when, by means of the handle, it can be conveniently agitated through the water in the wash-tub for the purpose of making suds.

### Greely's Cork-Extractor.

This article, which is represented in the accompanying illustrations, embodies, it will be observed, new features in a cork-

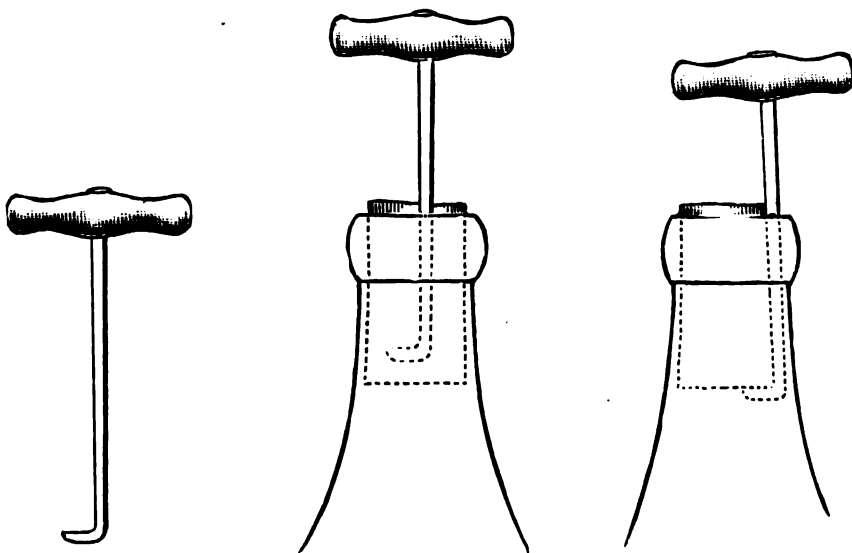


Fig. 1.—Greely's Cork Extractor.

Fig. 2 and 3.—Use of Cork Extractor.

extractor. It is represented in Fig. 1, while its use is indicated in Figs. 2 and 3. From these illustrations it will be seen that it consists of a piece of steel bent and

countered in drawing the cork the usual way. As indicated in Figs. 2 and 3, the extractor, the end of which is rounded so as to conform with the inside of the bottle neck, is inserted between the cork and the bottle, and when sufficiently far down the hook on the end is turned into the cork, as shown in Fig. 2, or as in Fig. 3, is placed directly under the end of the cork which may then be extracted. It is obvious that in the use of this article the cork is not as liable to be injured as with the ordinary corkscrew, and it is referred to as doing its work efficiently. These cork-extractors are made in eight different sizes and styles, giving a requisite variety for the different uses for which they may be required.

### The Leonard Cleanable Refrigerator and Creamer.

This article, which, as its name indicates, is intended to serve both as a refrigerator and a creamer, is made by the

two sides. One of these, the creamer side, is shown in the accompanying illustration. The other, the refrigerator side, is similar to the usual refrigerators. The interior construction is illustrated in Fig. 2, which gives a sectional view of the arrangement. From this it will be seen that the ice is placed in the middle of the creamer, and comes in contact with the milk-cans shown on the right, these cans being covered with a cloth jacket, which, as the can stands constantly in ice-water, draws the melted ice-water up around the can, producing the same effect, it is claimed, as though the cans were immersed

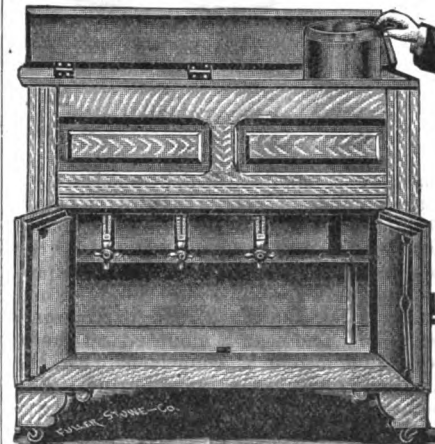


Fig. 1.—Creamer Side of Leonard Cleanable Refrigerator and Creamer.

in water. At the same time the opening in the bottom of the ice compartment permits the cold air to enter the refrigerator, the construction thus adapting this article to its double use. The waste-pipe, by which the water is carried off, is shown in the sectional view. An idea of the dimensions of this refrigerator can be

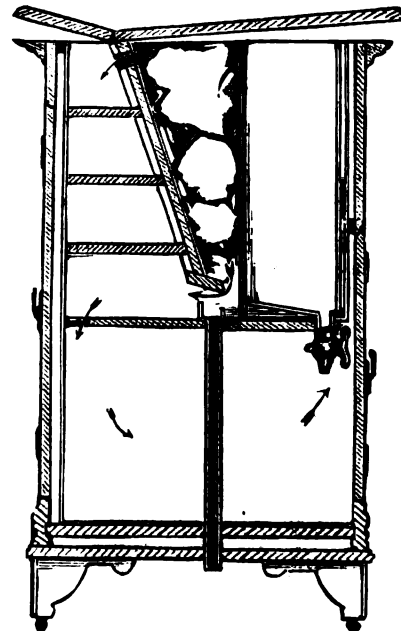


Fig. 2.—Sectional View.

gained from the fact that it stands 3 feet 6 inches high, has a width of 30 inches and length of 48 inches, and holds four 5-gallon milk-cans, 9 inches in diameter and 19 inches high, leaving room, as above explained, for a family refrigerator. One of the points emphasized in regard to this article is that it is, as its name implies, cleanable, as every part can readily be taken out to clean—the milk-cans being lifted out, the cover being entirely removable, the ice-rack sliding out, and the provision-shelves coming out readily, leaving a plain metal-lined box to clean and readily accessible in every part. The cases of the creamers are made of solid ash and finished in



the new antique finish, being two complete boxes one inside of the other, and the packing of non-conducting material between. Then follows a lining of water-proof paper

stead of to the tin, as in others, thus making no holes in the tin to cause rust. The hoops are beveled, being thicker at the bottom than at the top, making a substan-

ure and binding of the parts is avoided, making the operation of extracting the cork easy and simple, so that a lady or a child can pull a hard cork with ease. Fig.

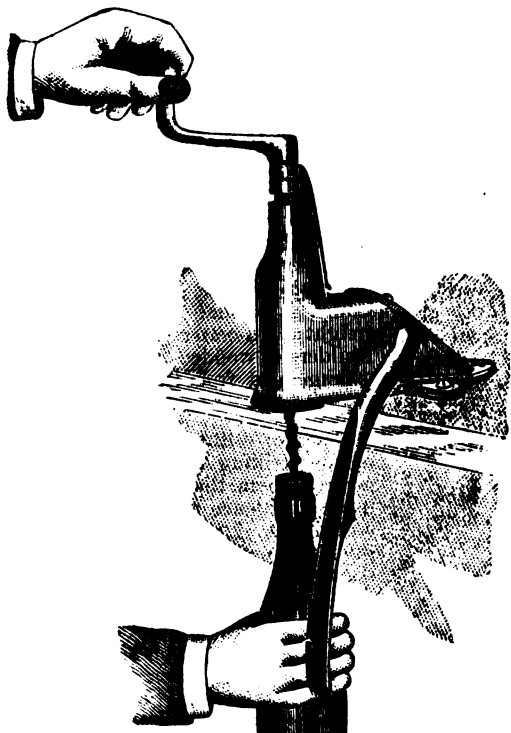


Fig. 1—Walker's Improved Cork-Puller.

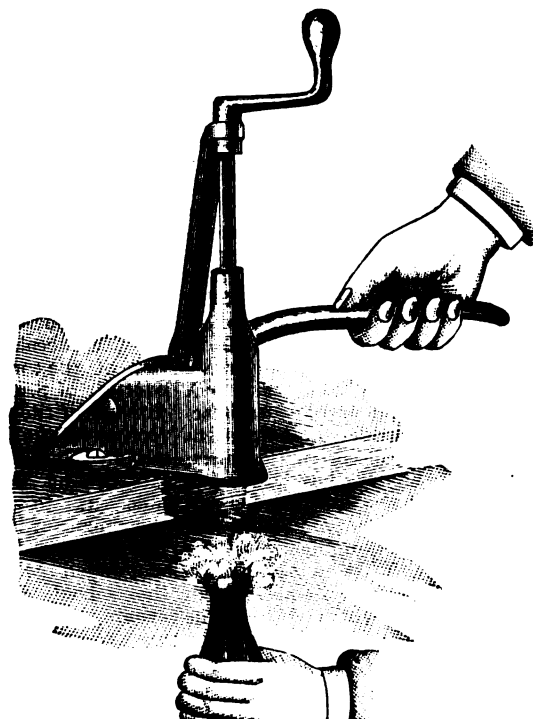


Fig. 2.—Showing Method of Extracting Cork.

and a lining of zinc, making five walls. As indicated in Fig. 1, the cans skim from the bottom by means of the faucet and the cream gauge shown. A small vial brush is sent out with each creamer to clean the faucets, and the company emphasize the importance of absolute cleanliness in butter-making, and allude to the fact that it is secured by the proper use of this creamer. Another point is that this method of cooling the cans is better than that of sinking them in water as less liable to cause rust holes in the cans. The utility and convenience of the refrigerator are also emphasized. The circular of the company gives also directions for the use of this creamer and refers to other points in regard to it.

#### Cooley's Patent Wood-Jacket Butter Packages.

These goods are made by Ball Bros. Glass Mfg. Company, Buffalo, N. Y. They are described as made from prime charcoal

tial base for the jacket to sit on. They are made in sizes 10, 20, 36 and 50 pounds.

#### Walker's Improved Cork-Puller.

This cork-puller, which is shown in the illustrations herewith given, is the invention of E. Walker, of the Erie Specialty

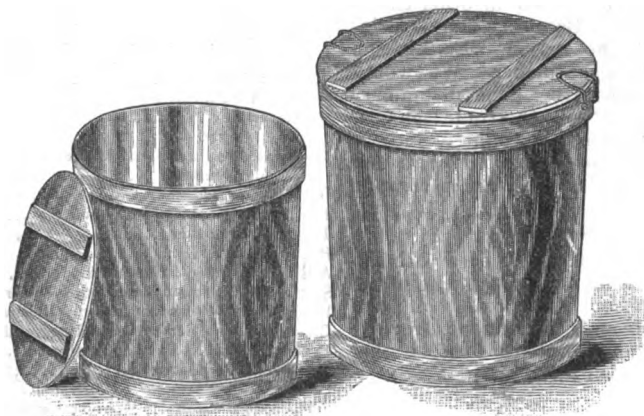
Mfg. Company, Erie, Pa., by whom it is manufactured. Fig. 1 represents it attached, and the corkscrew in process of insertion in the cork, while Fig. 2 shows the use of the lever by means of which the cork is extracted. From these cuts it will be seen that the machine is fastened by screws to a table or shelf, the cork being



Fig. 3.—Pattern of Corkscrew.

to be used on marble and in other places where the machine is to be moved often.

**The Clock Trade.**—One of the largest manufacturers of American clocks, Seth E. Thomas, in sketching the history of the clock trade, speaks of the substitution 47 years ago of brass wheels for the "grandfather's clock," and the marvelous changes that followed. The tower-clock attached to Independence Hall, Philadelphia, in centennial year, and which was donated to the city by Henry Seibert, cost \$6000. The largest one now being constructed is in St. Paul, Minn., which, aside from the chime of bells, will cost \$3000. The largest one in the world is in the new Parliament building in London. It was built by Dent, of that city, has a dial 27½ feet in diameter, and cost \$60,000. Plans are now preparing for a clock for the new City Hall in Philadelphia, to have a dial 30 feet across. This will be made for between \$40,000 and \$50,000. Our best foreign market is China and Japan, which take about \$150,000 annually. A few go to Russia and Constantinople. They take almost wholly the middle grades—those which cost by wholesale from \$4 to \$8. The more artistic affairs have little demand there. South America comes next. Then some go to Australia and the South Sea Islands—in fact, wherever ships go. The decrease in the price of silver was an immense factor in decreasing the foreign demand.



Cooley's Patent Wood-Jacket Butter Packages.

tin-plate, and incased in selected ash jackets firmly made, with the grain running up and down, so as to avoid splitting. The point is made that the fastener, as shown, is attached to the wood jacket in-

serted by means of the handle at the top, which revolves freely and is connected directly with the corkscrew. The power is applied by a crank-and-lever movement, and the point is made that all side press-

## Legal Decisions.

### CHATTEL MORTGAGES.

There were two mortgages on certain personal property, and the holder of the first mortgage foreclosed his lien and bought the goods for \$232, at the regular legal sale thereof. The junior mortgagee, claiming that the property was worth \$2500, sued the first mortgagee for the amount of the debt secured by his mortgage, on the ground that by the levy on this property the first mortgagee was chargeable with the actual value of the property, which, after satisfying his mortgage, he was bound to apply to the payment of subsequent incumbrances, and he recovered judgment for the amount of his debt. The case—*Dehority vs. Paxson*—was carried to the Supreme Court of Indiana, where the judgment was reversed. Judge Mitchell, in the opinion, said: "A levy on goods is not an absolute satisfaction, but is to be considered an apparent payment or satisfaction in that manner. If it appears that the levy has been regularly exhausted by a sale duly made, and that the sale has failed to produce a sum sufficient to satisfy the judgment, the levy and sale will be regarded as satisfaction for the amount realized, and a new execution may be had for the residue. The most that can be said is that a levy upon goods of sufficient value to pay the judgment raises the presumption that the execution is satisfied; but this presumption is overcome, as we have stated. If the price was so grossly inadequate as to shock a correct mind, this inadequacy might furnish a strong presumption of fraud or irregularity, and entitle any injured party to have the sale set aside upon reasonable application. The plaintiff has not taken this course, but, on the contrary, has pursued a course which defeats him. He has affirmed the decree taken by the defendant in this action, and that affirmation has the effect to affirm the price at which the property was sold. Besides, he was made a party to the foreclosure proceedings. He cannot have any help in the present suit, and the judgment must be reversed."

### PLEDGE—SALE BY MISTAKE—DAMAGES.

W. deposited certain non-dividend-paying stocks as collateral security for the payment of a loan made to him, and the holder of his note and these securities sold the securities before the debt or note fell due, contrary to instructions, but under an honest mistake of fact. The debtor sued to recover the value of the securities, though their proceeds had been applied to the payment of the debt, on the ground that the creditor had converted the stocks to his own use, and he recovered a judgment for the amount. In this case—*Wright vs. Bank of the Metropolis*—the case was carried to the Court of Appeals of New York, where the judgment was reversed. Judge Peckham, in the opinion, said: "The verdict in this case gave most unreasonable damages; they are positive in character and degree. We cannot see any question in the case showing bad faith, or indeed any reason for its existence. The fact is uncontradicted that the defendant sold the stock upon what its officers supposed was sufficient authority to sell it, and it cannot be punished for an honest mistake of fact. The plaintiff is entitled to recover his reasonable loss, and that reasonable loss must be ascertained. In our opinion that reasonable loss is to be determined in this way: The plaintiff should have gone into the market and bought the stocks within a reasonable time after he had learned that they had been illegally sold, and, having performed this just duty to the defendant, he would have had a claim for any loss he suffered by the application of the proceeds of the illegal sale to the payment of his debt, which

would be the difference between what he paid to get the stocks again and the amount of his debt with interest. There must be a new trial, and the judgment must be reversed."

### The Montreal Trade Schools.

The schools where trades are taught are in this country far fewer than those providing a course in manual training. Of the latter there are, comparatively speaking, a large number, for, in addition to the institutions specially devoted to it, the public schools are adopting manual training as a course in their regular curriculum. There are, however, not many trade schools proper in this country, and it is this class for which there is the greatest present need. The Montreal school provides instruction of the sort required. Through the courtesy of S. C. Stevenson, secretary and director of the Council of Arts and Manufactures of the Province of Quebec, we are supplied with a catalogue and circulars of the Montreal school, which enable us to present a summary of the courses of instruction. The season that has just closed began November 8, 1888, and ended April 8, during which period the school was open every week-day evening for one or more classes. There are two classes in free-hand drawing (junior and advanced), besides mechanical and architectural drawing, while the other courses are modeling and wood-carving, lithography, decorative painting, stairbuilding and building construction, plumbing and boot and shoe pattern making. In each of these classes instruction is given from two to four times a week, between the hours of 7.30 and 9.30 o'clock in the evening, the teachers being practical men, who, we believe, contribute part of their time gratuitously for the benefit of the scholars. There is a nominal fee of one dollar charged when the scholar was not in attendance at the preceding session, but even this amount is returned at the end of the course, except in the case of many absences. Furthermore, the material worked in is provided by the school, the student only having to supply tools and implements. With the exception of plumbing, the courses enumerated do not immediately concern many of our readers, but we do not think they will be the less interested in this brief account. There are two classes of people who are interested in industrial schools, boys and young men who want to learn a trade and parents who want their children taught a trade. The former class do not see *The Metal Worker*, while the latter are, for their children's sake, interested in other trades than their own. Because a man is a tinsmith there is no reason why his son should not be a shoemaker. We would like to be able to give a general summary of the courses of all the trade schools, day and evening, in this country, and we would be glad to receive circulars and catalogues from which we could compile such notices.

A smoke-burner has been tried with satisfactory results on one of the engines of the Wisconsin Central Railroad. A jet of superheated steam is introduced over the fire-box, causing an intense heat, so that the combustion is excellent.

American sailing vessels in the foreign trade are again good property. In this respect a marked change has taken place within a year or two, the supply of tonnage being now short of the demand and the rates of freight are again remunerative. A Newburyport (Mass.) paper says: "Ex-Mayor William A. Johnson owns in at least three barks, perhaps more.

Two of them have recently arrived home and been placed under favorable charters. The H. G. Johnson, Colby, has already begun loading freight for Java that will give her \$15,500, and leave her at Java just when the sugar crops will come off, assuring a good freight for home or Europe. The B. F. Hunt arrived only last Saturday, and as soon as possible will sail again for Australia, with a \$10,000 freight out, to be there just in season for a wool freight home, or any better that she may find. Three months will carry her back to Australia, and \$10,000 for a ship that a year ago would not have brought a dozen thousand, though worth more now when there is a use for her, will be a good paying business. The third, the Obed Baxter, Colby, is on her way home with a good freight and a better charter awaiting here." Builders of wooden ships will gather encouragement from these facts.

Emperor William received the delegates of the striking Westphalian miners. He assured them that the Government would use its influence to settle the dispute, but added that if necessary he would himself give the order to the military to shoot down rioters.

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# CURRENT HARDWARE PRICES.

MAY 22, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmied Edge, 1-10's.....	55¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....	70¢
Double Waterproof, 1-10's.....	1.10
Musket Waterproof, 1-10's.....	50¢
G. D.....	28¢
S. B.....	30¢
Union Metallic Cartridge Co.	
F. C. Trimmied.....	50¢
F. L. Ground.....	55¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof, 1-10's.....	1.10
Dbl. Waterproof, in 1-10's.....	1.10
S. B. Genuine Imp.orted.....	45¢
Eley's E. B.....	54¢
Eley's D Waterproof, Central Fire.....	1.60

Cartridges.	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	55¢
Cent. Fire, Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal., 1.175.....	2¢
Blank Cartridges, 32 cal., 1.50.....	2¢
Primed Shells and Bullets.....	15¢
B. B. Caps, Round Ball, 1.175.....	2¢
B. B. Caps, Con. Ball, Swgd., 2.00.....	2¢
Primers.....	2¢
Berdan Primers, 1.00.....	2¢
B. L. Caps (for Sturtevant Shells) 1.00.....	2¢
All other Primers, 1.20.....	2¢

Shells—	
First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands, 10 and 12 gauge.....	35¢
Club, Rival and Climax brands, 14, 16 and 20 gauge.....	30¢
Seibold's Shot Shells, 1st quality.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I. X. L., 10 and 12 gauge.....	40¢
"Special," 10 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	35¢

Shells Loaded—	
A. M. Co. List No. 19, 1887.....	20¢

Wads—	
U. M. C. & W. R. A.—B. E., 11 up, 2.00.....	2.00
U. M. C. & W. R. A.—B. E., 9 & 10.....	2.80
U. M. C. & W. R. A.—B. E., 7 & 8.....	2.80
U. M. C. & W. R. A.—P. E., 11 up, 3.10.....	3.10
U. M. C. & W. R. A.—P. E., 9 & 10.....	4.00
U. M. C. & W. R. A.—P. E., 7 & 8.....	4.00
Eley's B. E., 11 up.....	1.75
Eley's P. E., 11 up.....	2.80

Anvils—	
Eagle Anvil, 10¢.....	20¢
Peter Wright's.....	94¢
Armstrong's Mouse Hole.....	84¢
Armstrong's Mouse Hole, Extra 1 1/4.....	11¢
Trenton.....	94¢
Wilkinson's.....	94¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	38¢

Anvil Vise and Drill—	
Millers Falls Co., 18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, 38.00.....	40¢

Apple Parers—	
Advance.....	70¢
Antim Combination.....	50¢
Baldwin.....	50¢
Champion.....	75¢
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Gem.....	5.25
Gold Medal.....	4.00
Hudson's New '88.....	5.75
Ideal.....	4.75
Improved Bay State.....	30.00
Little Star.....	5.00
Monarch.....	13.50
New Lightning.....	5.50
Oriole.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.50
White Mountain.....	4.50
72.....	4.25
76.....	5.75
78.....	6.50

Augers and Bits—	
Douglas Mfg. Co.....	70¢
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	70¢
French, Swift & Co. (F. H. Beecher, Rockford Bit Company.....	55¢
Cook's, Douglas Mfg. Co.....	50¢
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Lip.....	80¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension.....	40¢
C. E. Jennings & Co., No. 30.....	40¢
C. E. Jennings & Co., Auger Bits, 1/2 set.....	32¢
32¢ quarters, No. 5, 45; No. 30, 35.50.....	40¢
Lewis' Patent Single Twist.....	25¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Fugh's Black.....	20¢
Rockford, Jennings' Pattern.....	60¢
Car Bits.....	50¢
L. Hommedieu Car Bits.....	15¢
Forstner Pat. Auger Bits.....	10¢

## Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas'.....	40¢
Bonney's Adjustable, 1/2 doz.....	40¢
Stearns'.....	20¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

## Expansive Bits—

Clark's small, 18; large, 32.....	35¢
Ives' No. 4, 1/2 doz.....	40¢
Swan's.....	40¢
Stearns' No. 1, 32; No. 2, 32.....	35¢
Stearns' No. 2, 48.....	20¢

## Gimlet Bits—

Common.....	25¢
Diamond.....	1.10
Bee.....	25¢
Double Cut, Sheppardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 1/2 gro.....	55¢
Double Cut, Douglas'.....	40¢
Double Cut, Ives'.....	60¢

## Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	50¢
Williams' or Holt's, for wood.....	40¢

## Ship Augers and Bits—

L'Hommedieu's.....	15¢
Watrous'.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

## Awl Hafts—

Sewing, Brass Fer. 1/2 gr, 35.50.....	45¢
Pat. Sewing, Short, 1.00 1/2 doz.....	40¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top, 1/2 gr \$10.00.....	45¢
Pat. Peg, Leather Top, 1/2 gr \$12.00.....	45¢

## Awls, Brad Sets, &c—

Awls, Sewing, Common 1/2 gr \$1.70.....	35¢
Awls, Should. Peg, 1/2 gr \$2.45.....	40¢
Awls, Pat. Peg, 1/2 gr 68¢.....	40¢
Awls, Shouldered Brad, 2.70 1/2 gr.....	35¢
Awls, Handled Brad, 1.75 1/2 gr.....	45¢
Awls, Handled Scratch, 1/2 gr, \$7.50.....	35¢
Awls, Socket Scratch, 1/2 doz, 1.50.....	25¢

## Awl and Tool Sets—

Alken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00.....	55¢
Frays' Adj. Tool Hds., Nos. 1, 12; 2, 18; 3, 24; 4, 30.....	25¢
Miller's Falls Adj. Tool Hds., No. 1, 12; 2, 18.....	25¢
Henry's Combination Haft, 1/2 doz \$6.50.....	35¢
Brad Sets, No. 42, \$10.50; No. 43, \$12.50.....	70¢
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢

## Axes—

Makers' and Special Brands—	
First quality.....	50¢
Others.....	55¢

## Axle Grease—

Fraser's.....	1/2 doz \$4.75, 1/2 doz \$5.50
Dixon's Everlasting, in bxs.....	1.20
Dixon's Everlasting, 10¢ pails, ea. 85¢.....	85¢
Lower grades, special brands.....	50¢

## Axles—

No. 1.....	40¢
No. 2.....	45¢
No. 3.....	50¢
No. 4.....	55¢
No. 5.....	60¢
No. 6.....	65¢
No. 7.....	70¢
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5).....	35¢
Less than 10 sets.....	35¢
Over 10 sets.....	35¢

## Bag Holders—

Sprengle's Pat.....	1/2 doz \$18.....
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## Balances—

Spring Balances.....	50¢
Common 24-in.....	1.50
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells—

## Hand—

Light Brass.....	70¢
Extra Heavy.....	80¢
White Metal.....	80¢
Shaver Chime.....	80¢
Globe (Cone's Patent).....	25¢

## Door—

Gong, Abbe's.....	38¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks'.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	25¢
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co.'s.....	50¢
Pull, Western.....	25¢

Common Wrought.....	60¢
Western, Sargent's list.....	70¢
Kentucky, "Star".....	70¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	40¢
Steel Alloy Church and School Bells.....	40¢

## Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

## Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	50¢

## Bench Stops—

Morrill's.....	1/2 doz \$3.50
Hotchkiss's.....	1/2 doz \$5.10
Weston's, No. 1, \$10; No. 2, \$9.25.....	10¢
McGill's.....	1/2 doz \$3.....

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension.....	40¢
Barber's, 1/2 doz \$15.00.....	40¢
Ives, 1/2 doz \$20.00.....	60¢
Diagonal.....	1/2 doz \$24.00
Angular.....	1/2 doz \$24.00

## Blind Adjusters—

Domestic.....	1/2 doz \$3.00
Excelsior.....	1/2 doz \$10.00
Washburn's Self-Locking.....	20¢

## Blind Fasteners—

Mackrell's, 1/2 doz \$1.00.....	20¢
Van Sand's Screw Pat., 15¢ 1/2 gr.....	60¢
Van Sand's Old Pat., 15¢ 1/2 gr.....	55¢
Washburn's Old Pattern, 1/2 gr.....	50¢
Merriman's.....	50¢
Austin & Eddy No. 2006, 1/2 gr.....	50¢
Security Gravity, 1/2 gr.....	50¢

## Blind Staples—

Barbed, 1/2 in. and larger.....	1/2 doz \$7.50
Barbed, 1/2 in.....	1/2 doz \$7.50

## Blocks—

Ordinary Tackle, list May 20, 1889.....	40¢
Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

## Belts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolts.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, all Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	40¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	50¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

## Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct., '84.....	75¢
Phila. pattern, list Oct. 7, '84.....	75¢
R.B. & W., old list.....	75¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

## Tire—

Common, list Feb. 28, '88.....	70¢
Port Chester Bolt and Nut Company: Empire, list Feb. 28, '83.....	70¢
Phila., list Oct. '84.....	82¢
Keystone, Philadel., list Oct. '84.....	80¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company: Norway, Phil., list Oct. 16, '84.....	75¢
Eagle, Phil., list Oct. 16, '84.....	80¢
Phila., list Oct. 16, '84.....	82¢
Bay State, list Feb. 28, '83.....	70¢
R.B. & W., Philadel., list Oct. 16, '84.....	82¢

## Stove and Plow—

Stove.....	65¢
Plow.....	60¢
R. B. & W., Plow.....	55¢

## Borax—

Without.....	1/2 doz \$9.40
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## Boring Machines—

Without.....	50¢
Augers, Upright, Angular.....	50¢
Douglas.....	5.50
Snell's, Rice's Pat. 5.50.....	6.75
Jennings.....	6.50
Other Machine.....	2.35
Phillips' Patent.....	7.00
With Augers.....	7.50

Bow Pins—	
Humason, Beckley & Co.'s.....	60¢
Sargent & Co.'s.....	17¢
Peck, Stow & W. Co.....	50¢

## Braces—

Barber's.....	50¢
Nos. 10 to 18.....	50¢
Nos. 20 to 33.....	50¢
Nos. 40 to 63.....	50¢
Barker's.....	75¢
Nos. 8, 10 and 12.....	75¢
Plated, Nos. 8, 10 and 12.....	75¢
Osgood's Ratchet.....	40¢
Spofford's.....	50¢
Ives' New Haven Novelty.....	70¢
New Haven Ratchet.....	60¢
Barber Ratchet.....	60¢
Barbers.....	60¢
Spofford.....	60¢
Common Ball, American.....	1.10
Bartholomew's.....	50¢
Nos. 25, 27 and 30.....	50¢
Nos. 117, 118, 119.....	70¢
Amidon's.....	75¢
Barker's Imp'd Plain.....	75¢
Barker's Imp. Nickeled.....	75¢
Ratchet.....	75¢

<b>Cards—</b>	
Horse & Curry	10¢10¢10¢10¢10¢
Cotton	10¢10¢10¢10¢
Wool	10¢10¢10¢10¢
<b>Carpet Stretchers—</b>	
Cast Steel, Polished	7 doz \$2.25
Cast Iron, Steel Points	7 doz \$0.80
Socket	7 doz \$1.75
Bullard's	25¢25¢10¢
<b>Carpet Sweepers—</b>	
Bissell No. 5	7 doz \$17.00
Bissell No. 7 New Drop Pan	7 doz \$19.00
Bissell, Grand	7 doz \$36.00
Grand Rapids	7 doz \$24.00
Crown Jewel, No. 2	\$18.00; No. 3, \$20.00
Magic	7 doz \$15.00
Jewel	7 doz \$17.00
Improved Parlor Queen	7 doz \$27.00
Nickel	7 doz \$22.00
Janned	7 doz \$22.00
Excelsior	7 doz \$22.00
Garland	7 doz \$18.00
Parlor Queen	7 doz \$24.00
Housewife's Delight	7 doz \$15.00
Queen	7 doz \$18.00
Queen, with band	7 doz \$18.00
King	7 doz \$18.00
Wood, Improved	7 doz \$18.00
Hub	7 doz \$18.00
Cog Wheel	7 doz \$18.00
Conqueror	7 doz \$22.00
Easy	7 doz \$22.00
Monarch	7 doz \$22.00
Goshen	7 doz \$18.00
Advance	7 doz \$18.00
Ladies' Friend, No. 1	7 doz \$15.00
No. 2	7 doz \$16.00
American	7 doz \$15.00
Grand Republic	7 doz \$35.00
<b>Cartridges—</b>	
See Ammunition.	
<b>Casters—</b>	
Bed	Brass, 55¢55¢25¢
Plate	Others, 60¢60¢5¢
Shallow Socket	40¢10¢
Deep Socket	40¢10¢
Yale Casters, list May, 1888	30¢10¢40¢
Yale, Gem	60¢60¢5¢
Martin's Patent (Phoenix)	45¢10¢50¢
Payson's Anti-friction	60¢60¢10¢
Giant Truck Casters	80¢
Stationary Truck Casters	50¢10¢
Socket Truck Casters	50¢
<b>Cattle Leaders—</b>	
Humason, Beckley & Co.'s	70¢
Sargent's	60¢60¢10¢
Hotchkiss	30¢
Peck, Stow & W. Co.	50¢10¢
<b>Chain—</b>	
Trace, 6½-10-2, exact	50¢10¢50¢10¢25¢
Trace, 6½-10-3, exact	50¢10¢50¢10¢25¢
Trace, 7-10-2, exact	50¢10¢50¢10¢25¢
Trace, 7-10-3, exact	50¢10¢50¢10¢25¢
Trace, 7-10-4, exact	50¢10¢50¢10¢25¢
Trace, 7-10-5, exact	50¢10¢50¢10¢25¢
Trace, 7-10-6, exact	50¢10¢50¢10¢25¢
Trace, 7-10-7, exact	50¢10¢50¢10¢25¢
Trace, 7-10-8, exact	50¢10¢50¢10¢25¢
Trace, 7-10-9, exact	50¢10¢50¢10¢25¢
Trace, 7-10-10, exact	50¢10¢50¢10¢25¢
Trace, 7-10-11, exact	50¢10¢50¢10¢25¢
Trace, 7-10-12, exact	50¢10¢50¢10¢25¢
Trace, 7-10-13, exact	50¢10¢50¢10¢25¢
Trace, 7-10-14, exact	50¢10¢50¢10¢25¢
Trace, 7-10-15, exact	50¢10¢50¢10¢25¢
Trace, 7-10-16, exact	50¢10¢50¢10¢25¢
Trace, 7-10-17, exact	50¢10¢50¢10¢25¢
Trace, 7-10-18, exact	50¢10¢50¢10¢25¢
Trace, 7-10-19, exact	50¢10¢50¢10¢25¢
Trace, 7-10-20, exact	50¢10¢50¢10¢25¢
Trace, 7-10-21, exact	50¢10¢50¢10¢25¢
Trace, 7-10-22, exact	50¢10¢50¢10¢25¢
Trace, 7-10-23, exact	50¢10¢50¢10¢25¢
Trace, 7-10-24, exact	50¢10¢50¢10¢25¢
Trace, 7-10-25, exact	50¢10¢50¢10¢25¢
Trace, 7-10-26, exact	50¢10¢50¢10¢25¢
Trace, 7-10-27, exact	50¢10¢50¢10¢25¢
Trace, 7-10-28, exact	50¢10¢50¢10¢25¢
Trace, 7-10-29, exact	50¢10¢50¢10¢25¢
Trace, 7-10-30, exact	50¢10¢50¢10¢25¢
Trace, 7-10-31, exact	50¢10¢50¢10¢25¢
Trace, 7-10-32, exact	50¢10¢50¢10¢25¢
Trace, 7-10-33, exact	50¢10¢50¢10¢25¢
Trace, 7-10-34, exact	50¢10¢50¢10¢25¢
Trace, 7-10-35, exact	50¢10¢50¢10¢25¢
Trace, 7-10-36, exact	50¢10¢50¢10¢25¢
Trace, 7-10-37, exact	50¢10¢50¢10¢25¢
Trace, 7-10-38, exact	50¢10¢50¢10¢25¢
Trace, 7-10-39, exact	50¢10¢50¢10¢25¢
Trace, 7-10-40, exact	50¢10¢50¢10¢25¢
Trace, 7-10-41, exact	50¢10¢50¢10¢25¢
Trace, 7-10-42, exact	50¢10¢50¢10¢25¢
Trace, 7-10-43, exact	50¢10¢50¢10¢25¢
Trace, 7-10-44, exact	50¢10¢50¢10¢25¢
Trace, 7-10-45, exact	50¢10¢50¢10¢25¢
Trace, 7-10-46, exact	50¢10¢50¢10¢25¢
Trace, 7-10-47, exact	50¢10¢50¢10¢25¢
Trace, 7-10-48, exact	50¢10¢50¢10¢25¢
Trace, 7-10-49, exact	50¢10¢50¢10¢25¢
Trace, 7-10-50, exact	50¢10¢50¢10¢25¢
Trace, 7-10-51, exact	50¢10¢50¢10¢25¢
Trace, 7-10-52, exact	50¢10¢50¢10¢25¢
Trace, 7-10-53, exact	50¢10¢50¢10¢25¢
Trace, 7-10-54, exact	50¢10¢50¢10¢25¢
Trace, 7-10-55, exact	50¢10¢50¢10¢25¢
Trace, 7-10-56, exact	50¢10¢50¢10¢25¢
Trace, 7-10-57, exact	50¢10¢50¢10¢25¢
Trace, 7-10-58, exact	50¢10¢50¢10¢25¢
Trace, 7-10-59, exact	50¢10¢50¢10¢25¢
Trace, 7-10-60, exact	50¢10¢50¢10¢25¢
Trace, 7-10-61, exact	50¢10¢50¢10¢25¢
Trace, 7-10-62, exact	50¢10¢50¢10¢25¢
Trace, 7-10-63, exact	50¢10¢50¢10¢25¢
Trace, 7-10-64, exact	50¢10¢50¢10¢25¢
Trace, 7-10-65, exact	50¢10¢50¢10¢25¢
Trace, 7-10-66, exact	50¢10¢50¢10¢25¢
Trace, 7-10-67, exact	50¢10¢50¢10¢25¢
Trace, 7-10-68, exact	50¢10¢50¢10¢25¢
Trace, 7-10-69, exact	50¢10¢50¢10¢25¢
Trace, 7-10-70, exact	50¢10¢50¢10¢25¢
Trace, 7-10-71, exact	50¢10¢50¢10¢25¢
Trace, 7-10-72, exact	50¢10¢50¢10¢25¢
Trace, 7-10-73, exact	50¢10¢50¢10¢25¢
Trace, 7-10-74, exact	50¢10¢50¢10¢25¢
Trace, 7-10-75, exact	50¢10¢50¢10¢25¢
Trace, 7-10-76, exact	50¢10¢50¢10¢25¢
Trace, 7-10-77, exact	50¢10¢50¢10¢25¢
Trace, 7-10-78, exact	50¢10¢50¢10¢25¢
Trace, 7-10-79, exact	50¢10¢50¢10¢25¢
Trace, 7-10-80, exact	50¢10¢50¢10¢25¢
Trace, 7-10-81, exact	50¢10¢50¢10¢25¢
Trace, 7-10-82, exact	50¢10¢50¢10¢25¢
Trace, 7-10-83, exact	50¢10¢50¢10¢25¢
Trace, 7-10-84, exact	50¢10¢50¢10¢25¢
Trace, 7-10-85, exact	50¢10¢50¢10¢25¢
Trace, 7-10-86, exact	50¢10¢50¢10¢25¢
Trace, 7-10-87, exact	50¢10¢50¢10¢25¢
Trace, 7-10-88, exact	50¢10¢50¢10¢25¢
Trace, 7-10-89, exact	50¢10¢50¢10¢25¢
Trace, 7-10-90, exact	50¢10¢50¢10¢25¢
Trace, 7-10-91, exact	50¢10¢50¢10¢25¢
Trace, 7-10-92, exact	50¢10¢50¢10¢25¢
Trace, 7-10-93, exact	50¢10¢50¢10¢25¢
Trace, 7-10-94, exact	50¢10¢50¢10¢25¢
Trace, 7-10-95, exact	50¢10¢50¢10¢25¢
Trace, 7-10-96, exact	50¢10¢50¢10¢25¢
Trace, 7-10-97, exact	50¢10¢50¢10¢25¢
Trace, 7-10-98, exact	50¢10¢50¢10¢25¢
Trace, 7-10-99, exact	50¢10¢50¢10¢25¢
Trace, 7-10-100, exact	50¢10¢50¢10¢25¢

<b>Cockeyes.</b>		50¢
<b>Cocks, Brass.</b>		40. & 10¢25¢
<b>Hardware list.</b>		40. & 10¢25¢
<b>Coffee Mills—</b>		
Box and Side, list Jan. 1, 1888	50¢25¢	
American, Enterprise Mfg Co. 20¢10¢30¢		
The Swift, Lane Bros.	20¢10¢	
<b>Compasses Dividers, &amp;c—</b>		
Compasses, Calipers, Dividers. 70¢70¢10¢		
Bemis & Call Co.'s	60¢25¢	
Dividers	50¢25¢	
Double	60¢	
Wing and Inside or Outside	50¢25¢	
Double	60¢	
(Call's Pat. Inside)	30¢	
Excelsior	60¢	
J. Stevens & Co.'s	25¢10¢	
Starrett's	30¢	
Spring Calipers and Dividers 25¢10¢10¢		
Lock Calipers and Dividers	25¢10¢	
Combination Dividers	25¢10¢	
<b>Coopers' Tools—</b>		
Bradley's	20¢	
Barton's	20¢25¢	
L. & I. J. White	20¢25¢	
Albertson Mfg. Co.	25¢	
Beatty's	30¢30¢25¢	
Sandusky Tool Co.	30¢30¢25¢	
<b>Corkscrews—</b>		
Humason & Beckley Mfg. Co. 40¢40¢10¢		
Clough's Pat.	35¢40¢50¢	
Howe Bros & Hulbert	35¢	
<b>Corn Knives and Cutters—</b>		
Bradley's	10¢	
Wadsworth's	25¢	
<b>Cradles—</b>		
Grain	50¢25¢	
<b>Crayons.</b>		
White Crayons, 7 gr 12¢12¢4¢	10¢	
D. M. Stewart Mfg. Co., Metal Work-	25¢	
ers, 7 gr. \$2.50		
D. M. Stewart Mfg. Co., Rolling Mill,	25¢	
7 gr. \$2.50		
See also Chalk.		
<b>Crow Bars—</b>		
Cast Steel	7 gr 4¢	
Iron, Steel Points	7 gr 3½¢	
<b>Curry Combs—</b>		
Fitch's	50¢10¢50¢10¢10¢	
Rubberer doz \$10.00	20¢	
Perfect	50¢	
<b>Curtain Pins—</b>		
Silvered Glass	net	
White Enamel	net	
<b>Cutlery—</b>		
Beaver Falls & Booth's	33½¢	
Wostenholme	\$7.75 to 2	
<b>Dampers, &amp;c—</b>		
Dampers, Buffalo	40¢10¢	
Buffalo Damper Clips	40¢10¢	
Crown Damper	40¢	
Excelsior	40¢10¢	
<b>Dividers—</b>		
See Compasses.		
<b>Dog Collars—</b>		
Embossed, Gilt, Pope & Steven's list	30¢10¢	
Leather, Pope & Steven's list	40¢	
Brass, Pope & Steven's list	40¢	
<b>Door Springs—</b>		
Torrey's Rod, regular size	7 doz \$1.30	
Gray's, 7 gr., \$20.00	20¢	
Beo Rod 7 gr., \$20.00	20¢	
Warner's No. 1, 7 doz, \$2.50; No. 2,	40¢10¢50¢	
\$3.30		
Gem (Coll), list April 19, 1888	20¢	
Star (Coll), list April 19, 1888	20¢	
Victor (Coll)	60¢60¢10¢	
Champion (Coll)	60¢10¢60¢10¢10¢	
Philadelphia, 5 in., \$5.00; 8 in., \$7.75.	2	
Cowell's, No. 1, 7 doz, \$18.00; No. 2,	15.00	
Rubber, complete, 7 doz, \$4.50.	65¢10¢	
Hercules	35¢	
Shaw Door Check and Spring	25¢30¢35¢	
<b>Drawing Knives—</b>		
Witherby	75¢25¢	
P. S. & W.	75¢10¢	
New Haven	60¢10¢60¢10¢5¢	
Merrill	75¢75¢5¢	
Douglas	15¢10¢25¢	
Watrous	15¢10¢25¢	
L. & I. J. White	20¢25¢	
Bradley's	25¢35¢	
Adjustable Handle	25¢35¢	
Wilkinson's Folding	25¢25¢35¢	
<b>Drills and Drill Stocks—</b>		
Blacksmiths' Self-Feeding, each \$1.75		
Breast, P. S. & W.	40¢10¢	
Breast, Wilson's	30¢25¢	
Breast, Millers Falls	each \$3.00, 25¢	
Breast, Bartholomew's	each \$2.50,	
25¢10¢40¢		
Ratchet, Merrill's	20¢20¢40¢	
Ratchet, Ingersoll's	20¢20¢40¢	
Ratchet, Parker's	20¢20¢40¢	
Ratchet, Whitney's	20¢10¢	
Ratchet, Weston's	20¢25¢	
Ratchet, Moore's Triple Action	25¢30¢	
Whitney's Hand Drill, Plain, \$11.00		
Adjustable, \$12.00	20¢10¢	
Wilson's Drill Stocks	20¢10¢	
Automatic Boring Tools	\$1.75¢11.35	
<b>Twist Drills—</b>		
Morse	60¢10¢25¢	
Standard	60¢10¢25¢	
Syracuse	60¢10¢25¢	
Cleveland	60¢10¢25¢	
Williams	60¢10¢25¢	
New Process	60¢10¢25¢	
<b>Drill Bits.—See Augers and Bits.</b>		

<b>Drill Chucks.—See Chucks.</b>	
<b>Dripping Pans—</b>	
Small sizes	7 gr 6½¢
Large sizes	7 gr 6½¢
<b>Egg Beaters.</b>	
Dover	7 doz \$1.50
National	7 doz \$1.50
Family (T. & S. Mfg. Co.), 7 gr \$17.00	
Duplex (Standard Co.)	7 gr \$15.00
Rival (Standard Co.)	7 gr \$12.00
Large Duplex (Standard Co.), 7 gr \$4.50	
Triumph (T. & S. Mfg. Co.), 7 gr \$10.50	
Advance, No. 1	7 gr \$10.50
Advance, No. 2	7 gr \$10.00
Bryant's	7 gr \$15.00
Ayres' Spiral	7 gr \$5.00
Double (H. & R. Mfg. Co.)	7 gr \$16.20
Easy (H. & R. Mfg. Co.)	7 gr \$14.00
Triple (H. & R. Mfg. Co.)	7 gr \$16.20
Spiral (H. & R. Mfg. Co.)	7 gr \$14.50
Palme, Diehl & Co.'s	7 gr \$24.00
<b>Egg Poachers—</b>	
Buffalo Steam Egg Poachers, 7 doz, No.	
1, \$6.00; No. 2, \$8.00.	25¢
<b>Electric Bell Sets.—</b>	
Wollensak's	20¢
Biglow & Dowse	20¢
Emery—No. 4 to No. 54 to Flour, CF	
150 gr. F F F	
Kege, 7 gr 4½¢	5
Kege, 7 gr 4½¢	5½¢
Kege, 7 gr 4½¢	5½¢
10-b cans, 10	6½¢
10-b cans, less	10
than 10	10
<b>Enamelled and Tinned Ware—</b>	
See Hollow Ware.	
<b>Escutcheon Pins—</b>	
Iron, list Nov. 11, 1888	50¢10¢50¢10¢25¢
Brass	60¢60¢5¢
<b>Escutcheons.</b>	
Door Lock—Same dis as Door Locks.	
Brass Thread	60¢60¢10¢
Wood	25¢
<b>Faucets.—</b>	
Penn's	40¢
Bohren's Pat. Rubber Ball	35¢45¢
Penn's Cork Stops	35¢45¢
Star	60¢
Franny's Pat. Petroleum	40¢5¢25¢
B. & L. B. Co.	
West's Lock, Open and Shut Key	50¢
Star, Metal Plug, new list	40¢
Lockport, Metal Plug, reduced list	60¢
Metallic Key, Leather Lined	60¢10¢10¢
Cork Lined	70¢5¢70¢10¢
Burnside's Red Cedar	60¢
Burnside's Red Cedar, bbl lots	50¢10¢
John Sommers	
Peerless Best Block Tin Key	40¢
XL 1st quality, Cork Lined	50¢
Diamond Lock	40¢
Perfection, Fla. Red Cedar	50¢
Goodenough Cedar	50¢
Boss Metallic Key	50¢
Reliable Cork Lined	60¢
Western Pattern Cork Lined	50¢
Self-Measuring	
Enterprise, 7 doz \$50.00	20¢10¢
Lane's, 7 doz \$36.00	25¢10¢
Victor, 7 doz \$36.00	25¢10¢



<b>Cross-Cut Saw Handles—</b>	
Atkins' No. 1 Loop, pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.	
Boynton's Loop Saw Handles, 50¢.	60¢
Champion.....	15¢
<b>Hangers—</b>	
Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England.....	60¢10¢10¢70¢
Samson Steel Anti-Friction.....	55¢
Orleans Steel.....	55¢
Hamilton Wrought Wood Track.....	55¢
U. S. Wood Track.....	55¢
Champion.....	60¢10¢
Rider and Wooster, Medina Yfg. Co.'s list.....	70¢
Climax Anti-Friction.....	90¢
Ilmax Anti-Friction for Wood Track.....	55¢
Zenth for Wood Track.....	55¢
ed's Steel Arm.....	50¢
allenge, Barn Door.....	50¢
Sterling's Improved (Anti-Friction).....	65¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	60¢25¢
Chertice.....	50¢10¢60¢
Kidder's.....	50¢10¢60¢
The Boss.....	60¢10¢
Best Anti-Friction.....	60¢10¢
Duplex (Wood Track).....	60¢10¢55¢
Terry's Pat., 7 doz pr. 4, \$10.00; 5 in. \$12.00.....	50¢60¢10¢
Cronk's Pat. No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00.....	60¢15¢60¢
Wood Track Iron Rail, 7 ft. 10¢.....	60¢
Carrier Steel Anti-Friction.....	60¢50¢55¢
Architect, 7 set \$6.00.....	20¢
Eclipse.....	20¢10¢
Felix, 7 set \$4.50.....	30¢30¢10¢
Richards.....	30¢30¢10¢
Lane's Steel Anti-Friction.....	40¢10¢
Ball Bearing Door Hanger.....	20¢10¢20¢10¢
Warner's Pat.....	20¢20¢10¢
Stearns' Anti-Friction.....	20¢20¢10¢
Stearns' Challenge.....	25¢10¢20¢10¢
Faultless.....	40¢40¢10¢
American, 7 doz, \$6.00.....	40¢40¢10¢
Rider & Wooster, No. 1, 63¢; No. 2, 75¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Paragon, Nos. 5, 6, 7 and 8.....	20¢10¢
Crescent.....	60¢60¢10¢
Nickel Cast Iron.....	50¢
Nickel Malleable Iron and Steel.....	50¢
Scranton Anti-Friction Single Strap.....	35¢4¢
Scranton Anti-Friction Double Strap.....	40¢
Universal Anti-Friction.....	40¢
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....	40¢10¢40¢10¢
Star.....	50¢50¢10¢
May.....	50¢50¢10¢
Barry, \$5.00.....	40¢10¢
<b>Harness Snaps—</b>	
See Snaps.	
<b>Hatchets—</b>	
List Jan. 1, 1886.	
Isiah Blood.....	35¢40¢
Hunt's Shingling, Lath and Claw.....	40¢
Hunt's Broad.....	40¢
Buffalo Hammer Co.....	40¢10¢50¢
Hurd's.....	40¢10¢50¢
Fayette R. Plumb.....	40¢10¢50¢
Wm. Mann, Jr., & Co.....	50¢50¢55¢
Underhill Edge Tool Co.....	40¢50¢10¢
Underhill and Bright.....	40¢50¢10¢
C. Hammond & Son.....	40¢10¢50¢
Simmons.....	40¢10¢50¢
Peck's.....	40¢10¢40¢10¢55¢
Kelly's.....	50¢50¢55¢
Sargent & Co.....	50¢
Ten Eyck Edge Tool Co.....	40¢10¢40¢10¢55¢
Collins.....	50¢
Schulte, Lohoff & Co.....	50¢50¢55¢
<b>Hay and Straw Knives—</b>	
Lighting, Mfrs. price 7 doz \$18.00, 25¢ But jobbers frequently give extras.	
Gem.....	40¢7¢40¢10¢
Wadsworth's.....	40¢7¢40¢10¢
Carters Needle.....	7 doz \$11.50¢12.00
Heath's.....	7 doz \$13.50¢14.00
Auburn Hay, Com. and Spear Point.....	50¢
Auburn, Straw.....	40¢
Nolin's Hay.....	7 doz \$10.00
<b>Hinges—</b>	
<b>Wrought Iron Hinges</b>	
Strap and T.....	75¢5¢75¢10¢
Screw Hook and.....	6 to 12 in. 7¢ 3¢4¢
Strap.....	14 to 20 in. 7¢ 3¢4¢
Heavy Welded Hook.....	22 to 30 in. 7¢ 3¢4¢
Hook.....	14 to 20 in. 7¢ 3¢4¢
Screw Hook.....	22 to 30 in. 7¢ 3¢4¢
and Eye.....	14 in. 7¢ doz \$1.50
14 in. 7¢ doz \$2.45	10¢
14 in. 7¢ doz \$3.80	
Rolled Blind Hinges, Nos. 32 and 34.....	50¢10¢
Rolled Blind Hinges, Nos. 232 and 234.....	55¢10¢
Rolled Plate.....	70¢10¢
Rolled Raised.....	70¢10¢
Plate Hinges, 8, 10 & 12 in. 7¢ 5¢	
"Providence" over 12 in. 7¢ 4¢	
<b>Spring Hinges</b>	
Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co.'s list, March, 1886.....	20¢
Acme and U. S.....	30¢
Empire and Crown.....	20¢
Hero and Monarch.....	50¢
American, Gem, and Star, Japaned.....	20¢
American, Gem, and Star, Bronzed.....	20¢
Oxford, Bronze and Brass.....	net
Barker's Double Acting.....	20¢10¢
Union Mfg. Co.....	25¢
Bommer's.....	30¢
Buckman's.....	15¢20¢
Chicago.....	50¢
Wiles.....	10¢
Devore's.....	40¢
Rex.....	40¢
Royal.....	60¢
Reliable.....	60¢
Champion.....	60¢
<b>Gate Hinges—</b>	
Western.....	7 doz \$4.40, 60¢
N. E. Reversible.....	7 doz \$7.00, 55¢
N. E. Reversible.....	7 doz \$6.20, 55¢10¢
Clark's, Nos. 1, 2, 3.....	60¢10¢55¢
N. Y. State.....	7 doz \$5.00, 55¢10¢
Automatic.....	7 doz \$12.50, 50¢
Common Sense.....	7 doz pair \$4.50, 50¢
Seymour's.....	70¢
Shepard's.....	60¢10¢55¢
Reed's Latch and Hinges.....	7 doz \$12.00, 50¢
<b>Blind Hinges—</b>	
Parker.....	75¢25¢
Palmer.....	50¢55¢10¢
Seymour.....	70¢
Nicholson.....	45¢10¢
Butter.....	50¢

<b>Clark's, Nos. 1, 3, 5, 40 and 50</b>	
75¢10¢55¢90¢	
Clark's Mortise Gravity.....	50¢
Sargent's, Nos. 1, 3, 5, 11, 13.....	75¢10¢55¢10¢55¢
Reading's Gravity.....	75¢10¢75¢10¢55¢
<b>Shepard's</b>	
Noiseless.....	75¢10¢55¢
Niagara.....	80¢25¢
Buffalo.....	80¢25¢
Clark's Genuine Pat.....	80¢25¢
O. S. Lull & Porter.....	75¢10¢
Acme, Lull & Porter.....	75¢25¢
Queen City Reversible.....	75¢
Clark's Lull & Porter, Nos. 0, 1, 1 1/4, 2, 2 1/4, 3.....	75¢10¢25¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....	25¢25¢
<b>Hoes—</b>	
<b>Handled—</b>	
Garden, Mortar, &c.....	55¢
Planter's Cotton, &c.....	55¢
Warren Hoe.....	60¢
Magic.....	7 doz \$4.00
<b>Eye—</b>	
D. & H. Scovill.....	20¢
Lane's Crescent Planters Pattern.....	45¢25¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢25¢
Sandusky Tool Co., S. & O. Pat.....	50¢
Hubbard & Co., S. & O. Pat.....	50¢
Chattanooga Tool Co., S. & O. Pat.....	50¢
Grub.....	60¢60¢10¢
<b>Hog Rings and Ringers—</b>	
Hill's Improved Ringers.....	7 doz \$4.25
Hill's Old Style Ringers.....	7 doz \$3.75
Hill's Tongs.....	7 doz \$4.50
Hill's Rings.....	7 doz box \$3.15¢2.25
Perfect Rings.....	7 doz box \$1.90¢1.70
Perfect Ringers.....	7 doz \$2.15¢2.25
Blair's Hog Rings.....	7 doz \$2.25¢2.50
Blair's Hog Ringers.....	7 doz \$0.90¢1.00
Champion Ringers.....	7 doz \$2.00
Champion Rings, Double.....	7 doz \$2.25
Brown's Ringers.....	7 doz \$2.00
Brown's Rings.....	7 doz \$1.25¢1.30
<b>Holesting Apparatus—</b>	
Moore's Hand Holst, with Lock Brake.....	20¢
Moore's Differential Pulley Block.....	40¢
Energy Mfg. Co's.....	25¢
<b>Holders, File and Tool—</b>	
Bals Pat.....	7 doz \$4.00; 25¢
Nicholson File Holders.....	20¢
<b>Hollow-Ware—</b>	
<b>Iron—</b>	
<b>Stove Hollow-Ware—</b>	
Ground.....	60¢60¢55¢
Unground.....	60¢10¢60¢10¢10¢
Boilers and Saucepans.....	40¢55¢
Tinned Boilers and Saucepans.....	40¢
Gray Enameled-Ware—	
Stove.....	45¢50¢
Mashin Kettles.....	60¢10¢60¢10¢10¢
Boilers and Saucepans.....	40¢55¢
Agate and Granite Ware, list Jan. 1, 1889.....	35¢40¢10¢
Rustless Hollow-Ware.....	50¢60¢55¢
Galvanized Tea-Kettles—	
Inch..... 6 7 8 9	
Each..... 55¢ 60¢ 65¢ 75¢	
<b>Silver Plated—</b>	
4 mo. or 5 x cash in 30 days.	
Reed & Barton.....	40¢55¢
Meriden Britannia Co.....	40¢55¢
Simpson, Hall, Miller & Co.....	40¢55¢
Rogers & Brother.....	40¢55¢
Harford Silver Plate Co.....	40¢55¢
William Rogers Mfg. Co.....	40¢55¢
<b>Hooks—</b>	
<b>Cast Iron—</b>	
Bird Cage, Sargent's list.....	45¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢10¢
Clothes Line, Reading.....	60¢10¢10¢10¢
Ceiling, Sargent's list.....	55¢10¢10¢
Harness, Reading list.....	55¢10¢10¢55¢10¢10¢
Coat and Hat, Sargent's list.....	55¢10¢10¢10¢
Coat and Hat, Reading.....	50¢10¢50¢10¢10¢
<b>Wrought Iron—</b>	
Cotton.....	7 doz \$1.25
Cotton Pat. (N.Y. Mallet & Handle Wks).....	30¢
Tassel and Picture (T. & S. Mfg. Co.).....	50¢
Wrought Staples, Hooks, &c.....	50¢
<b>See Wrought Goods.</b>	
<b>Wire—</b>	
Wire Coat and Hat, Gem, list April, 1886.....	45¢
Wire Coat and Hat, Miles, list April, 1886.....	45¢
Indestructible Coat and Hat.....	45¢
Wire Coat and Hat, Standard.....	45¢
Belt.....	75¢10¢50¢
<b>Miscellaneous.</b>	
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.....	7 doz \$2.25
Nollin's Grass.....	7 doz \$2.25
Bush.....	55¢90¢
Whiffetree—Patent.....	55¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	60¢10¢10¢
Fish Hooks, American.....	50¢
Bench Hooks.....	See Bench Stops.
<b>Horse Nails—</b>	
Nos. 6 7 8 9 10	
Ausable.....	28¢ 26¢ 25¢ 24¢ 23¢
Clinton, Fin.....	24¢ 22¢ 21¢ 20¢ 19¢
Essex.....	28¢ 26¢ 25¢ 24¢ 23¢
Lyra.....	25¢ 23¢ 22¢ 21¢ 20¢
Snowden.....	25¢ 23¢ 22¢ 21¢ 20¢
Putnam.....	23¢ 21¢ 20¢ 19¢ 18¢
Vulcan.....	23¢ 21¢ 20¢ 19¢ 18¢
Northwest.....	25¢ 23¢ 22¢ 21¢ 20¢
Globe.....	23¢ 21¢ 20¢ 19¢ 18¢
Boston.....	23¢ 21¢ 20¢ 19¢ 18¢
A. C.....	25¢ 23¢ 22¢ 21¢ 20¢
C. B. K.....	25¢ 23¢ 22¢ 21¢ 20¢
Champlain.....	28¢ 26¢ 25¢ 24¢ 23¢

<b>New Haven.....</b>	
28¢ 26¢ 25¢ 24¢ 23¢	
Saranac.....	23¢ 21¢ 20¢ 19¢ 18¢
Champion.....	25¢ 23¢ 22¢ 21¢ 20¢
Capewell.....	28¢ 26¢ 25¢ 24¢ 23¢
Star.....	23¢ 21¢ 20¢ 19¢ 18¢
Anchor.....	23¢ 21¢ 20¢ 19¢ 18¢
Western.....	23¢ 21¢ 20¢ 19¢ 18¢
Empire Bronzed.....	14¢ 13¢
<b>Horse Shoes—See Shoes Horse.</b>	
<b>Hose, Rubber—</b>	
Competition.....	75¢10¢75¢10¢55¢
Standard.....	70¢70¢10¢
Extra.....	60¢60¢10¢
N. Y. B. & P. Co., Para.....	80¢10¢
N. Y. B. & P. Co., Extra.....	50¢
N. Y. B. & P. Co., Dundee.....	60¢10¢55¢
<b>Huskies—</b>	
Blair's Adjustable.....	7 gr \$8.00
Blair's Adjustable Clipper.....	7 gr 7.00
<b>Indurated Fiber-Ware.</b>	
Spittoons, No. 2, 7 doz.....	\$6.75
Basins, Ringed, 7 doz, No. 1, \$3.70; No. 2, \$3.10; No. 3.....	\$2.70
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 7 doz, nests.....	\$16.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 7 doz, nests.....	\$6.37
Butter Bowls 15, 17 and 19-inch (3 pieces), 7 doz, nests.....	\$6.75
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), 7 set.....	\$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (6 pieces), 7 set.....	\$2.25
<b>See also Tools.</b>	
<b>Jack Screws—See Screws.</b>	
<b>Kettles—</b>	
Brass, 7 to 17 in., 7 doz.....	24¢ 21¢
Brass larger than 17 in., 7 doz.....	26¢ 23¢
Enameled and Tea Kettles.....	See Hollow-Ware.
<b>Keys—</b>	
Lock Ass'n list Dec. 30, 1886.....	50¢10¢
Eagle, Cabinet, &c.....	33¢45¢
Hotchkiss' Brass Blanks.....	40¢
Hotchkiss, Copper and Tinned.....	40¢
Hotchkiss' Pad, and Cab.....	35¢
Hotchkiss' Bed Keys.....	7 doz \$4.00, 15¢
Wollensak Tinned.....	50¢10¢
<b>Knife Sharpeners—</b>	
Parkin's.....	Applewood Handles..... 7 doz \$6.00, 40¢
Rosewood or Cocobolo.....	7 doz \$6.00, 40¢
<b>Knives—</b>	
Wilson's Butcher Knives.....	25¢30¢
Ames' Butcher Knives.....	25¢
Butcher Knife, &c.....	40¢
Nichols' Butcher Knives.....	40¢10¢
Ames' Shoe Knives.....	20¢25¢
Ames' Bread Knives.....	7 doz \$1.50, 15¢20¢
Moran's Shoe and Bread.....	20¢
Hay and Straw.....	See Hay Knives.
Table and Pocket.....	See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.....	\$2.00
Corn, Auburn Mfg. Co. Crescent.....	\$3.50
<b>Knobs—</b>	
Door Mineral.....	55¢65¢
Door Por. Jap'd.....	75¢78¢
Door Por. Nickel.....	\$2.00¢2.25
Door Por. Picked.....	\$2.00¢2.25
Drawer Porcelain.....	60¢10¢60¢10¢10¢
Hemlock Door Knobs.....	40¢10¢50¢
Yale & Towne Wood, list Dec., 1886.....	40¢
Furniture Plain.....	75¢ gro 10¢ 10¢
Furniture Wood Screws.....	25¢10¢
Base, Rubber Tip.....	70¢10¢55¢
Picture, Judd's.....	60¢10¢10¢70¢
Picture, Sargent's.....	70¢10¢
Picture, Hemlock.....	35¢55¢
Shutter, Porcelain.....	65¢10¢
Carriage, Jap.....	7 gro 80¢, 60¢10¢
<b>Ladies—</b>	
Melting, Sargent's.....	55¢10¢
Melting, Reading.....	35¢10¢
Melting, Monroe's Pat.....	7 doz \$4.00, 40¢
Melting, P. S. & W.....	35¢10¢40¢
Melting, Warner's.....	30¢
<b>Lawn Mowers—</b>	
Standard List.....	50¢10¢
Quaker City.....	60¢10¢
Enterprise.....	60¢10¢
<b>Lanterns—</b>	
<b>Tubular—</b>	
Plain with Guards, 7 doz.....	\$4.00¢4.25
Lift Wire, with Guards.....	\$4.50¢4.75
Square Plain, with Guards.....	\$4.00¢4.25
Sq. Lift Wire, with Guards.....	\$4.25¢4.50
Without Guards, 25¢ 7 doz less.	
<b>Miscellaneous.</b>	
Police, Small, \$3.00; Medium, \$7.25; Large, \$9.75.....	30¢25¢
<b>Lemon Squeezers—</b>	
Porcelain Lined, No. 1.....	7 doz \$6.00, 25¢30¢
Wood, No. 2.....	7 doz \$3.00, 35¢
Wood, Common.....	7 doz \$1.70¢1.75
Dunlap's Improved.....	7 doz \$3.75, 20¢
Sammls.....	No. 1, \$5.00; No. 2, \$9.12; \$18 7 doz..... 25¢10¢
Jennings' Star.....	7 doz \$2.50
The Boss.....	7 doz \$2.50
Dean's, Nos. 1, 7 doz \$6.50; 2, \$3.35; 3, \$1.90.....	
Little Giant.....	50¢50¢55¢
King.....	40¢55¢
<b>Lines—</b>	
Cotton and Linen Fish, Draper's.....	50¢
Draper's Chalk.....	60¢
Draper's Mason's Linen, 84 ft., No. 1, 1.25; No. 2, 1.75; No. 3, \$2.25; No. 4, 2.75; No. 5, \$3.25.....	25¢
Cotton Chalk.....	25¢
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50.....	10¢
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 7 gro.....	25¢
Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.....	45¢
Mason's Colored Cotton.....	45¢
Wire Clothes.....	Nos. 18 19 20 \$3.60 \$3.00 \$2.5

**Melasses Gates—**

Stebbin's Pat.	70¢@70¢7½
Stebbin's Genuine	60¢@10¢10½
Stebbin's Tinned Ends	40¢10½
Chase's Hard Metal	50¢10½
Bush's	20¢
Lincoln's Pattern	70¢@70¢10
Wood's	20¢10½
Boss, 7 doz.	
No. 1, 87; No. 2, 88; No. 3, 89; No. 4, 90	60¢@10¢10½

**Money Drawers—**

Wires, 1 doz. \$3.00, 25¢

**Muzzles—**

Safety, 1 doz. \$3.00, 25¢

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny, 70¢10½

Wire Nails, Standard Penny, 70¢10½

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Wire Nails, Standard Penny, 70¢10½

**Plane Irons—**

Plane Irons	20¢10½
Plane Irons, Butcher's	\$5.00@5.25 to 2
Plane Irons, Buck Bros	40¢
Plane Irons, Auburn Tool Co., "This- le"	40¢
Sandusky Tool Co.	
Single and Cut	30¢
Double	40¢
L. & I. J. White	25¢

**Pliers and Nippers—**

Button's Patent	30¢10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00	50¢
Humason & Beckley Mfg. Co.	50¢10¢10½
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢25¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinner's Cutting Nippers	add 8¢ dis 10¢
Carew's Pat. Wire Cutters	20¢
Morrill's Parallel, 7 doz, \$12.00	30¢25¢
Cronk's 8 in., \$15.00; 10 in., \$21.00	40¢40¢25¢

**Plumb and Levels—**

Regular List	70¢10¢70¢10¢10½
Diston's	45¢10½
Pocket Levels	70¢10¢70¢10¢10½
Davis Iron Levels	30¢
Davis' Inclination	10¢10½

**Polish, Metal.**

Prestoline	20¢10½
Krestoline Paste	30¢
Gaston's Silver Compound	35¢25¢

**Pokes, Animal—**

Bishop's I. X. L.	7 doz \$8.50
Bishop's O. K.	7 doz \$8.50
Bishop's Pioneer	7 doz \$3.75
Bishop's American	7 doz \$3.00

**Poppers, Corn—**

Round or Square, 1 qt.	7 gr \$12.00@15.00
Round or Square, 2 qt.	7 gr \$25.00@28.00

**Post Hole and Tree Augers****and Diggers—**

Samson Post Hole Digger	7 doz \$36.00
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Fletcher Post Hole Augers	7 doz \$30, 20¢
Eureka Diggers	7 doz \$16.00@17.00
Leed's	7 doz \$8.00@9.00
Vaughan's Post Hole Auger	7 doz \$10.00

Kohler's Little Giant	7 doz \$13.00
Kohler's Hercules	7 doz \$15.00
Kohler's New Champion	7 doz \$9.00
Schneider	7 doz \$18.00
Ryan's Post Hole Diggers	7 doz \$24.00
Cronk's Post Bars	7 doz \$60.00

Gibbs Post Hole Digger	7 doz \$30.00, 50¢
Imperial	7 doz \$15.00

**Potato Parers—**

White Mountain	7 doz \$5.00@5.50
Antrim Combination	7 doz \$8.00
Hooster	7 doz \$13.50

**Pruning Hooks and Shears—**

Diston's Combined Pruning Hook and Saw	7 doz \$18.00, 20¢10¢
Diston's Pruning Hook	7 doz \$12.00

E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's	7 doz \$3.75, 40¢ net
Henry's Pruning Shears	7 doz \$4.25, 40¢ net

Wheeler, M. & C. Co.'s Combination	7 doz \$12.00, 20¢
Dunlap's Saw and Chisel	7 doz \$8.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

**Pulleys—**

Hot House, Awning, &c.	60¢10½
Japanned Screw	60¢10½
Brass Screw	60¢10½
Japanned Side	60¢10½
Japanned Clothes Line	60¢10½
Empire Sash Pulley	55¢60¢
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50	50¢10¢50¢10¢25¢
Hay Fork, "Anti-Friction," 5 in. Solid, \$6.70	50¢
Hay Fork, "F" Common and Pat.	50¢
Bushed	20¢
Hay Fork, Paradox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	20¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel	7 doz \$12.00

**Pumps—**

Cistern, Best Makers	50¢10¢60¢
Pitcher Spout, Best Makers	60¢10¢60¢
Pitcher Spout, Cheaper Goods	70¢10¢25¢

**Punches—**

Saddlers' or Drive, good	7 doz. 60¢65¢
Bemis & Call Co.'s Cast Steel Drive	60¢25¢
Bemis & Call Co.'s Springfield Socket	60¢25¢
Spring, good quality	7 doz \$2.50@2.90
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinner's	7 doz \$1.44, 50¢
Tinner's Hollow Punches	20¢25¢
Rice Hand Punches	15¢
Avery's Revolving	30¢10½
Avery's Saw-Set and Punch. See Saw Sets.	

**Rail—**

Sliding Door, Wrt Brass	7 doz \$35.00, 15¢
Sliding Door, Bronzed Wrt Iron	7 doz \$4.00, 15¢
Sliding Door, Iron, Painted	7 foot \$4.00, 40¢
Barn Door, Light In.	2 5/8 3/4
Per 100 feet	\$2.00 2 5/8 3/4, 10¢
B. D. for N. E. Hangers	
Small	Med. Large
Per 100 feet	\$2.15 2 7/8 3 3/8, net
Terry's Wrought Iron	7 foot. 4¢@5¢
Victory Track Rail, 7¢ foot	50¢25¢
Carrier Steel Rail, 7¢ foot	4¢@5¢
Moore's Wrought Iron	25¢

**Rakes—**

Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢10¢70¢
Malleable	70¢70¢25¢
Gibbs Lawn Rake	\$12.00, 50¢15¢
Canon Lawn Rake	\$0.00, 50¢10¢
Lt. Madison Prize Bow Brace and Peer- less	65¢
Fort Madison Steel Tooth Lawn Rake	\$0.00

**Razors—**

J. R. Torrey Razor Co.	20¢
Westenholme and Butcher	\$10.00 to 2, 10¢

**Razor Straps—**

Genuine Emerson	60¢@60¢55¢
Imitation	7 doz \$2.00, 20¢10¢55¢
Torrey's	20¢
Badger's Belt and Com.	7 doz \$2.00
Lamont Combination	7 doz \$4.00

**Rivets and Burrs—**

Iron, list Nov. 17, '87	50¢
Copper	50¢10¢50¢10¢25¢

**Rivet Sets.**

50¢10½	
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**Reds—**

Stair, Brass	25¢25¢
Stair, Black Walnut	7 doz 40¢

**Rollers—**

Barn Door, Sargent's list	60¢10¢10½
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢

**Rope—**

Manufacturers' prices for large lots:	
Manila, 1/4 in. and larger	7 doz \$15.00
Manila, 1/2 in. and larger	7 doz \$16.00
Manila, 3/4 in. and larger	7 doz \$17.00
Manila, 1 in. and larger	7 doz \$18.00
Manila, 1 1/4 in. and larger	7 doz \$19.00
Manila, 1 1/2 in. and larger	7 doz \$20.00
Manila, 1 3/4 in. and larger	7 doz \$21.00
Manila, 2 in. and larger	7 doz \$22.00
Manila, 2 1/4 in. and larger	7 doz \$23.00
Manila, 2 1/2 in. and larger	7 doz \$24.00
Manila, 2 3/4 in. and larger	7 doz \$25.00
Manila, 3 in. and larger	7 doz \$26.00
Manila, 3 1/4 in. and larger	7 doz \$27.00
Manila, 3 1/2 in. and larger	7 doz \$28.00
Manila, 3 3/4 in. and larger	7 doz \$29.00
Manila, 4 in. and larger	7 doz \$30.00

**Saws—**

Diston's Cir- cular	45¢@45¢55¢
Diston's Cross Cuts	45¢@45¢55¢
Diston's Hand 25¢25¢55¢	
Atkins' Circular Shingle and Heading	50¢10½

**Saw Frames—**

White Vermont	7 gro \$9.00@10.00
Red, Polished and Varnished	7 doz \$1.50, 25¢

**Saw Sets—**

Stillman's Genuine	7 doz \$5.00@7.75, 40¢55¢
Stillman's Imita.	7 doz \$3.25@5.25, 40¢55¢
Common Lever	7 doz \$2.00, 40¢55¢
Morrill's No. 1, \$15.00; Nos. 2 & 3, \$24.00	40¢10¢50¢
Leach's No. 0, \$8.00; No. 1, \$15.00; No. 2, \$24.00	20¢10¢20¢10¢10½
Nash's	20¢10¢20¢10¢10½
Hammer, Hotchkiss	\$5.00, 10¢
Hammer, Bemis & Call Co.'s new Pat.	30¢55¢

**Saw Teels—**

Atkin's Perfection, \$15.00; Excelstor,	\$6.00 7 doz
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**Scales.**

Hatch, Counter, No. 171, good quality	7 doz \$21.00
Hatch, Tea, No. 161	7 doz \$8.75@9.00
Union Platform, Plain	\$2.10@2.30
Union Platform, Striped	\$2.20@2.30
Chatillon's Grocers' Trip Scales	50¢
Chatillon's Eureka	25¢
Chatillon's Favorite	40¢
Family Turnbills	30¢@30¢10½
Rieble Bros' Platform	40¢

**Scale Beams—**

Scale Beams, list Jan. 12, '82	50¢10½
Chatillon's No. 1	40¢
Chatillon's No. 2	50¢

**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.)	7 doz \$21.00
Box, 1 Handle	7 doz \$4.00, 10¢
Box, 2 Handle	7 doz \$6.00, 10¢
Defiance Box and Ship	20¢10½
Foot	50¢10¢60¢
Ship, Common	7 doz \$3.5

Flat Head, Iron.....	55¢
Round Head, Iron.....	50¢
Bench and Hand—	
Bench, Iron.....	55¢10@55¢10@10¢
Bench, Wood, Beech.....	50¢ doz \$2.25
Bench, Wood, Hickory.....	20¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coach and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & E. Mfg. Co.....	70¢10¢75¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢5¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
Scroll Saws—	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers'.....	15¢
Barnes' Scroll Saw Blades.....	25¢
Scythe Snaths.....	
50¢25¢	
Shears—	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning.....	See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....	50¢ doz \$3.75
Tinners'.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	35¢45¢
First quality C. S. Trimmers.....	80¢80¢10¢
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clipper.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co. Solid Steel Forged.....	60¢
Clauss Shear Co., Japanned.....	70¢
Clauss Shear Co., Nickeled, same list.....	70¢
Sheaves—	
Siding Door—	
M. W. Co., List July, 1888.....	50¢10¢90¢5¢
R. & E., List Dec. 18, 1885.....	55¢20¢
Corbin's list.....	60¢10¢25¢
Patent Roller.....	60¢10¢25¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
Siding Shutter—	
R. & E. list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
Ship Tools—	
L. & I. J. White.....	30¢25¢
Albertson Mfg. Co.....	25¢
Shoes, Horse, Mule, &c.—	
Horse—	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
Mule—	
Add \$1 per keg to above prices.	
Oz. Wrought—	
Ton lots.....	9¢ 9¢
1000 lb lots.....	9¢ 9¢
500 lb lots.....	10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 5 bag, 25 lb.....	\$1.16
Drop, 5 bag, 25 lb.....	20¢
Buck and Chilled, 5 25 lb bag.....	1.41
Buck and Chilled, 5 25 lb bag.....	.34
Shovels and Spades—	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
Note.—Jobbers frequently give 5¢ off 7¢ extra on above.	
Griffith's Black Iron.....	50¢10¢
Griffith's C. S. list.....	60¢60¢25¢
Griffith's Solid C. S. R. Goods.....	20¢
Old Colony (Sanford Fork & Tool Co.).....	20¢
St. Louis Shovel Co.....	30¢20¢75¢
Hussey, Binns & Co.....	20¢20¢75¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	20¢20¢75¢
Payne Pettibone & Son, list January, 1886.....	30¢
Remington's (Lowman's) Pat. 30¢10¢40¢	
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
Shovels and Tongs—	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
Skins, Thimble—	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	30¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skins.....	60¢
Utica Turned and Fitted.....	35¢
Stoves—	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Shaker (Barber's Pat.) Flour Sifters.....	50¢ doz \$2.00
Electric.....	50¢ doz \$2.00
Hunter's.....	50¢ doz \$2.00
Smith's Adjustable Sifters.....	50¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	50¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	50¢ doz \$2.00
Stoves, Wooden Rim—	
Mesh 18, Nested, 5 doz.....	70¢ 80¢
Mesh 20, Nested, 5 doz.....	85¢ \$1.00
Mesh 24, Nested, 5 doz.....	\$1.00 1.10
Stoves—	
School, by case.....	40¢
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	65¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢25¢
Covert, New Patent.....	50¢5¢25¢
Covert, New E. E.....	80¢25¢
Covered Spring.....	60¢10¢10¢
Soldering Irons—	
Covert's Adjustable, list Jan. 1, 1888.....	35¢25¢
Spoke Shaves—	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	20¢10¢30¢
Spoke Trimmers—	
Bonney's.....	50¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 50¢ doz.....	55¢10¢
Douglas.....	50¢ doz \$9.00, 20¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp. Co's list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co's list.....	70¢10¢
Buffalo S. S. & Co.....	38¢25¢
Silver-Plated—(4 mos. or 5¢ cash 30 days)	
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢60¢
L. Boardman & Son.....	50¢10¢
Miscellaneous.	
Holmes & Edwards Silver Co.: No. 67 Mexican Silver.....	50¢10¢
No. 30 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 50 Nickel Silver.....	50¢10¢
No. 49 Nickel Silver.....	50¢10¢
German Silver, Hall & Elton, 50¢5¢ cash Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	70¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case.....	60¢
Springs—	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢25¢
Cliff's Bolster Springs.....	25¢
Squares—	
Steel and Iron.....	75¢10¢80¢
Nickel-Plated.....	60¢10¢60¢10¢
Try Square and T Bevels.....	60¢10¢60¢10¢
Disston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	30¢25¢
Staples—	
Fence Staples, Galvanized.....	Same price as F&B Wire
Fence Staples, Plain.....	See Trd. Rep.
Steelyards.....	
40¢10¢50¢	
Stocks and Dies—	
Blacksmith's	
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	33¢45¢40¢
Stone—	
Hindustan No. 1, 3¢; Aze, 3¢4¢; Slips No. 1, 4¢	
Sand Stone.....	2¢ 2¢4¢
Washita Stone, Extra.....	19¢20¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	10¢11¢
Washita Slips, No. 1, Extra.....	30¢35¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	40¢
Turkey Slips.....	\$1.00 \$1.50
Lake Superior Slips, Chise.....	31¢32¢
Seneca Stone, Red Paper Brand.....	20¢25¢
Seneca Stone, High Rounds.....	20¢25¢
Seneca Stone, Small Whets.....	20¢25¢
Steve Polish—	
Joseph Dixon's.....	50¢ doz \$6.00, 10¢
Gem.....	50¢ doz \$4.50, 10¢
Gold Medal.....	50¢ doz \$6.00, 25¢
Mirror.....	50¢ doz \$6.00, 25¢
Lustro.....	50¢ doz \$4.75
Ruby.....	50¢ doz \$3.75
Rising Sun, 5 doz lots.....	50¢ doz \$5.50
Dixon's Plumbago.....	50¢
Boynton's Noon Day.....	50¢
Parlor Pride Stove Enamel.....	50¢ 50¢ cans
Yates' Liquid.....	50¢ 50¢ gal.....
Yates Standard Paste Polish, 10-lb cans.....	12¢4¢
Jet Black.....	50¢ 10¢
Japanese.....	50¢ 30¢
Fireside.....	50¢ 25¢
Diamond O. K. Enamel.....	50¢ 10¢
Bonnell's Liquid Stove Polish.....	50¢ 50¢
Bonnell's Paste Stove Polish.....	50¢ 50¢
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....	12¢4¢
Nickel Plate Paste.....	50¢ 60¢
Tacks, Brads, &c.—	
List, Jan. 2, 1888.—(Note.—Some man- ufacturers are selling Tacks at slightly higher prices than those named.)	
Steel Carpet.....	80¢80¢25¢
Swedes Iron Carpet.....	80¢80¢25¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢5¢75¢10¢
Swedes Iron, Upholsterers'.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners'.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters' or Railroad.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢25¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
Common and Patent Brads, 70¢10¢70¢	
10¢10¢	
Hungarian Nails.....	
70¢10¢70¢10¢10¢	
Chair Nails.....	
70¢10¢70¢10¢10¢	
Zinc Glaziers' Points.....	
50¢50¢25¢	
Cigar Box Nails.....	
50¢10¢50¢10¢25¢	
Picture-Frame Points.....	
50¢10¢50¢10¢25¢	
Looking-Glass Tacks.....	
50¢10¢50¢10¢25¢	
Leathered Carpet.....	
50¢10¢50¢10¢25¢	
Brush Tacks.....	
50¢10¢50¢10¢25¢	
Shoe Finders, List Jan. 2, 1888, 10¢10¢	
10¢10¢25¢	
Lining and Saddle Nails, List Jan. 1, 1888:	
Silvered.....	30¢10¢10¢
Japanned.....	20¢10¢10¢
Double-Pointed Tacks.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire	
Steel Wire Brads, R. & E. Mfg. Co's list.....	50¢10¢
Tap Borers—	
Common and Kind.....	20¢10¢
Enterprise Mfg. Co.....	33¢45¢
Clark's.....	33¢45¢
Tapes, Measuring—	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
Thermometers—	
Tin Case.....	80¢80¢10¢
Thimble Skins—See Skins.	
Ties, Bale—Steel	
Standard Wire, list.....	50¢10¢5¢
Tinners' Shears, &c.—	
Shears and Snips (P. S. & W.).....	20¢25¢
Punches, see Punches	
Snips, J. Mallinson & Co.....	33¢45¢
Tinware—	
Stamped, Japanned and P. J. ed, list Jan. 20, 1887.....	75¢75¢25¢
Tire Benders, Upsetters, &c—	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
Tobacco Cutters—	
Champion.....	20¢10¢30¢
Wood Bottom.....	50¢ doz \$5.00, 55¢
All Iron.....	50¢ doz \$4.25
Nashua Lock Co's.....	50¢ doz \$5.00
Wilson's.....	50¢
Sargent's.....	50¢ doz \$24.55, 10¢
Acme.....	50¢ doz \$20.00, 40¢
Transom Lifters—	
Wellensack's: Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiter's, list Jan. 1, 1887.....	50¢10¢2
Bronzed Iron Rods.....	30¢
Brass, Real Bronze or Nickel Plate.....	50¢10¢25¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
Traps—	
Game—	
Newhouse.....	35¢40¢25¢
Onedia Pattern.....	70¢70¢25¢
Game, Blake's Patent.....	40¢10¢25¢
House and Rat—	
Mouse Wood Choker, 7 doz holes, 11¢12¢	
Mouse, Round Wire.....	50¢ 10¢
Mouse, Cage, Wire.....	50¢ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	50¢ doz \$2.50, 15¢
Mouse, "Bonanza".....	50¢ gr \$10.00
Mouse Delusion.....	50¢ gr \$15.00
Rat, "Decoy".....	50¢ gr \$10.00, 10¢
Ideal.....	50¢ gr \$5.00
Cyclone.....	50¢ gr \$5.00
Hotchkiss Metallic Mouse, 5-hole traps.....	50¢ doz \$5.00
In full cases.....	50¢ doz \$5.00
Trowels—	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Disston's Br'k and Plastering.....	25¢25¢10¢
Peace's Plastering.....	25¢
Clement & Maynard's.....	20¢
Rose's Brick.....	15¢20¢
Worral's Brick and Plastering.....	20¢
Garden.....	70¢
Triers—	
Butter and cheese.....	25¢
Trucks, Warehouse, &c.—	
B. & L. Block Co.'s list, '82.....	40¢
Tubes, Boiler—	
See Pipe.	
Twine—	
Flax Twine.....	BC. B.
No. 9, 4 and 1/2 lb Balls.....	22¢ 30¢
No. 12, 4 and 1/2 lb Balls.....	21¢ 29¢
No. 13, 4 and 1/2 lb Balls.....	18¢ 28¢
No. 24, 4 and 1/2 lb Balls.....	18¢ 25¢
No. 38, 4 and 1/2 lb Balls.....	16¢ 27¢
No. 284, Mattress, 4 and 1/2 lb Balls.....	45¢50¢
Chalk Line, Cotton, 1/2 lb Balls.....	25¢
Mason Line, Linen, 1/2 lb Balls.....	55¢
2-Ply Hemp, 4 and 1/2 lb Balls (Spring Twine).....	11¢4¢
3-Ply Hemp, 1 lb Balls.....	12¢15¢
3-Ply Hemp, 1 1/2 lb Balls.....	11¢11¢
Cotton Wrapping, 5 Balls to lb.....	15¢10¢
2, 3, 4 and 5-Ply Jute, 1/2 lb Balls.....	10¢
Wool.....	6¢4¢5¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢
Vises—	
Solid Box.....	60¢60¢25¢
Parallel.....	25¢
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
Parker's.....	
20¢25¢	
Wilson's.....	
55¢	
Howard's.....	
40¢	
Bonney's.....	
40¢10¢	
Millers Falls.....	
40¢40¢10¢	
Trenton.....	
40¢5¢40¢10¢	
Merrill's.....	
15¢20¢	
Sargent's.....	
80¢10¢10¢	
Backus and Union.....	
15¢10¢	
Frontis.....	
30¢5¢25¢	
Simpson's Adjustable.....	
40¢	
Moore's.....	
20¢	
Saw Filers—	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10¢
Stearns.....	38¢40¢33¢40¢10¢
Stearns' Silent Saw Vises.....	33¢40¢25¢
Sargent's.....	60¢40¢10¢
Stoking's.....	50¢10¢
Reading.....	50¢ doz \$17.50, 10¢
Wentworth.....	30¢10¢
Combination Hand Vises.....	50¢ gr \$42.00
Cowell Hand Vises.....	20¢
Bauer's Pipe Vises.....	10¢
Wagon Boxes—	
Per d.....	24¢
Wagon Jacks—	
Daisy.....	25¢

# CURRENT METAL PRICES.

MAY 22, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
1/2 to 2 in. round and square.	1/2 lb 1.90 @ ...
1 to 6 in. x 1/2 to 1 in.	1/2 lb 1.90 @ ...
Refined Iron:	
1/2 to 2 in. round and square.	1/2 lb 2.00 @ 2.10¢
1 to 6 in. x 1/2 to 1 in.	1/2 lb 2.00 @ 2.10¢
1 to 6 in. x 1/2 to 1 in.	1/2 lb 2.20 @ 2.30¢
Beds—1/2 and 1-16 round and sq.	1/2 lb 2.10 @ 2.20¢
Bands—1 to 6 x 1/2 to 1 in.	1/2 lb 2.20 @ 2.30¢
"Burden Best" Iron, base price.	1/2 lb 3.00 @ ...
Burden's "H. B. & S." Iron, base price.	1/2 lb 2.80 @ ...
"Ulster"	1/2 lb 3.10 @ ...
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.	
Per pound.	
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/2¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots.	5 ¢

Sheet Iron from Store.	
Common American. R. G. Cleaned.	
10 to 16.	1/2 lb 2.75 @ 2.80¢
17 to 20.	1/2 lb 2.85 @ 3.00¢
21 to 24.	1/2 lb 3.00 @ 3.10¢
25 and 26.	1/2 lb 3.20 @ 3.50¢
27.	1/2 lb 3.35 @ 3.75¢
28.	1/2 lb 3.50 @ 4.00¢
B. B.	
Galv'd, 14 to 20.	1/2 lb 4.50 @ 4.88¢
Galv'd, 21 to 24.	1/2 lb 4.87 1/2 @ 4.75¢
Galv'd, 25 to 26.	1/2 lb 5.25 @ 5.12¢
Galv'd, 27.	1/2 lb 5.62 1/2 @ 5.48¢
Galv'd, 28.	1/2 lb 6.00 @ 5.85¢
Patent Planchet.	1/2 lb 10 ¢
Russia.	1/2 lb 9 1/4 ¢
American Cold Rolled B. B.	1/2 lb 5 ¢ @ 7 ¢

English Steel from Store.	
Per lb.	
Best Cast.	1/2 lb 15 ¢
Extra Cast.	1/2 lb 16 1/2 ¢
Swaged Cast.	1/2 lb 16 ¢
Best Double Shear.	1/2 lb 15 ¢
Blister, 1st quality.	1/2 lb 12 ¢
German Steel, Best.	1/2 lb 10 ¢
2d quality.	1/2 lb 9 ¢
Sheet Cast Steel, 1st quality.	1/2 lb 15 ¢
2d quality.	1/2 lb 14 ¢
3d quality.	1/2 lb 12 1/2 ¢

METALS.	
Tin.	
Banca, Pigs.	23 ¢
Straits, Pigs.	22 ¢
English, Pigs.	24 1/2 ¢
Straits in Bars.	24 ¢

Tin Plates.	
Charcoal Plates.—Bright.	
Melny Grade.	Per box.
1C, 10 x 14.	\$5.75 @ \$6.00
1C, 12 x 12.	6.00 @ 6.25
1C, 14 x 20.	5.75 @ 6.00
1C, 20 x 28.	12.00 @ 12.50
1C, 10 x 14.	7.25 @ 7.50
1C, 12 x 12.	7.50 @ 7.75
1C, 14 x 20.	7.25 @ 7.50
1C, 20 x 28.	15.00 @ 15.50
1C, 12 1/2 x 17.	5.50 @ 5.75
1C, 12 1/2 x 17.	7.00 @ 7.25
Call and Grade.	1C, 10 x 14.
1C, 12 x 12.	6.00 @ 6.25
1C, 14 x 20.	5.75 @ 6.00
1C, 10 x 14.	7.25 @ 7.50
1C, 12 x 12.	7.50 @ 7.75
1C, 14 x 20.	7.25 @ 7.50
Allaway Grade.	1C, 10 x 14.
1C, 12 x 12.	5.00 @ 5.12 1/2
1C, 14 x 20.	5.00 @ 5.12 1/2
1C, 20 x 28.	11.00 @ 11.25
1C, 10 x 14.	6.00 @ 6.25
1C, 12 x 12.	6.25 @ 6.50
1C, 14 x 20.	6.00 @ 6.25
1C, 20 x 28.	12.00 @ 12.50
1C, 12 1/2 x 17.	4.75 @ 5.00
1C, 12 1/2 x 17.	5.75 @ 6.00

Coke Plates.—Bright.	
Steel Coke.—1C, 10 x 14, 14 x 20.	\$4.75 @ \$5.00
10 x 20.	7.25 @ 7.50
20 x 28.	9.75 @ 10.25
IX, 10 x 14, 14 x 20.	5.50 @ 5.75
BV Grade.—1C, 10 x 14, 14 x 20.	4.40 @ 4.60
Charcoal Plates.—Terne.	
Dean Grade.—1C, 14 x 20.	\$4.85 @ \$4.62 1/2
20 x 28.	8.75 @ 9.25
IX, 14 x 20.	5.40 @ 5.62 1/2
20 x 28.	11.00 @ 11.87 1/2
Abecarne Grade.—1C, 14 x 20.	4.25 @ 4.50
20 x 28.	8.45 @ 9.00
IX, 14 x 20.	5.25 @ 5.50
20 x 28.	10.50 @ 10.80

Tin Boiler Plates.	
1XX, 14 x 20.	112 sheets @ \$12.50 @ \$12.75
1XX, 14 x 28.	112 sheets @ 12.75 @
1XX, 14 x 31.	112 sheets @ 14.25 @

Copper.	
Duty: Pig. Bar and Ingot, 4¢; Old Copper, 3¢	
Manufactured (including all articles of which Copper is a component of chief value), 45 ¢ ad valorem.	
Ingot.	
Lake.	@ 13 1/4 ¢
Anchor Brand.	@ 12 1/4 ¢

Sheet and Bolt.  
Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887, being quotations for all sized lots.

Weights per square foot and prices per pound.	
Not wider than	Not longer than
Over 64 oz.	Over 64 oz.
32	32
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# THE IRON AGE

THURSDAY, MAY 30, 1889.

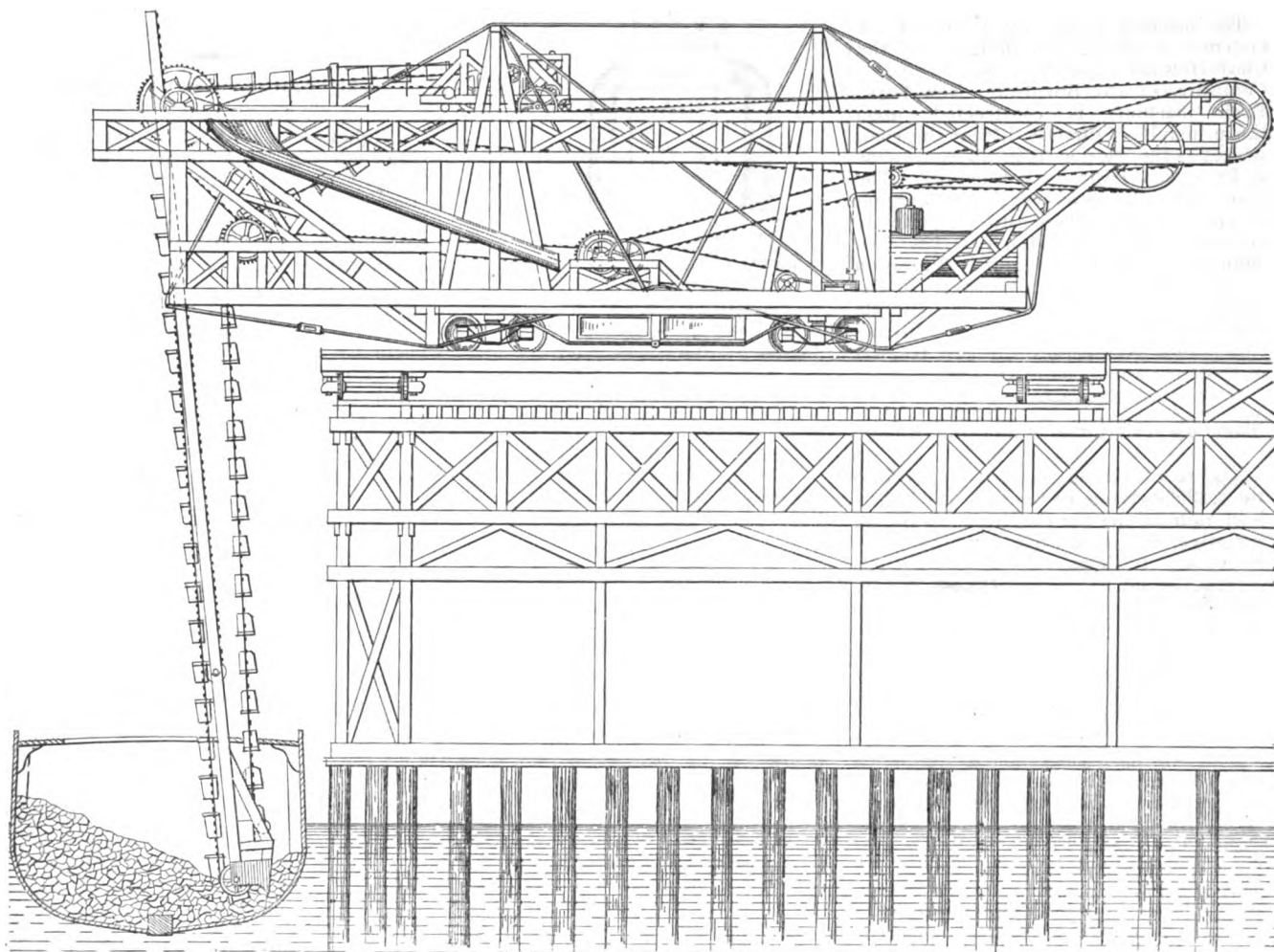
## Subways in New York.

The net-work of overhead wires that disfigured this city is rapidly disappearing, about 10,000 miles having been put underground within the last five months, under peremptory orders from Mayor Grant. At the last report the Metropolitan Telephone Company had about 7000 miles of wire in the subways, the Western Union Telegraph Company about 2000 miles, the Edison Company and fire telegraph each about 200 miles. There are two kinds of subways. One is used for electric lighting

forever. The subways for telegraph and telephone wires extend much further than the subways for electric lighting. They cover ground from the Battery to Fifty-ninth street, having four trunk lines at present toward the central portion of the city and many crossways, especially downtown. The big cables that are put in the subway look very much like the electric lighting cables, but they are quite different in construction. The telegraph and telephone wires are much smaller than the others, and some of these cables contain as many as 200 wires each. Thus far

## Portable Coal Lift.

The accompanying illustrations represent a portable coal lift so arranged that it can be run over the line of the dock and dropped into the hatch of the vessel; it can further be shifted from one hatch to another without requiring the moving of the vessel, as the elevator proper is mounted on a car which traverses the line of the face of the dock. From the side elevation it will be observed that the elevator is carried by two systems of trucks or wheels which permit of its



THE CLARK-HOWARD PORTABLE COAL LIFT.—SIDE ELEVATION.

wires alone, and no telegraph or telephone wires can be put in the same box. Generally speaking, the subways for the electric lighting conductors extend from Fifty-ninth to Fourteenth streets and from Fourth to Sixth avenues, with crossways at a dozen streets. Into these boxes are put only the conductors for lighting and power, and they are quite different from the telegraph or telephone wires. The Edison Company use a heavy cable, in the center of which run two pretty stiff copper rods, completely insulated, so as to prevent contact with any other wire or with moisture. What is called the Callender conductor, for electric light and power, is composed of 12 strands of copper bound together. These cables are inclosed in lead pipe, not only to give strength, but mainly to protect the insulating material and prevent the intervention of moisture. Some of the cables cost \$1 a foot, but they are intended to last almost

there have been about 80 miles of subway laid, covering 600 blocks. Each subway contains about 300 miles of wire, but none of the subways is full, and each can contain as many as can ever be required to meet the demands of trade. About 1200 poles have been removed.

Advertisements for bids for building three new 2000-ton unarmored cruisers for the navy are being prepared at the Navy Department. The vessels will be known as cruisers 9, 10 and 11, and are to be built at a cost not exceeding \$700,000 each. It was left discretionary by Congress with the Navy Department to build either gunboats or cruisers, and the latter were chosen.

A revision of the Cuban tariff has been completed by the Spanish Government, but the nature of the changes made is not stated.

being projected beyond or moved parallel with the line of the dock. The elevating buckets are carried by endless chains traveling over sheaves placed as shown. These chains pass around a sheave at the foot of the leg, over stationary sheaves at the outer end of the frame and around a traveling sheave moving on tracks along the top of the frame. The traveling sheave moves forward or toward the front end of the machine while the leg is being lowered into the vessel, so that the chain is always under the same degree of tension. The boiler and engine operating the machine are placed on the car, with which they move. All the movements of the machine are completely under the control of the engineer. The coal can be taken from either side of the boat. When raised to the top the coal is emptied into either one of two shutes placed at the sides of the elevator. The coal is not dumped violently from the

buckets, but by a peculiar arrangement the buckets are, so to speak, withdrawn from their load, thus reducing the risk of breaking the coal to a minimum. The machine illustrated, which was made for one of the largest coal handlers in the East, has a capacity of 200 tons per hour, the speed of the buckets being 75 feet per minute; it has a lift of 74 feet and an adjustment of 50 feet. When not in operation the elevator is raised and housed on top of the coal pockets inside of the dock line. A similar machine to the above has been in operation at the coal piers of the Philadelphia and Reading Railroad for the past six months, working every day and handling from 100 to 360 tons of coal per hour. The coal is lifted from storage piles and delivered to cars for shipment, and is also taken from the cars as they come from the mines and stored in piles 50 to 100 feet away.

This machine forms only a part of the system of handling coal designed by the Clark-Howard Excavator and Conveyor Company, of 137 Broadway, New York. Each machine is constructed upon the principle of directly lifting the coal, which, as the motion is in all cases slow and the load large, is not broken. The speed influences in no way the discharging of the buckets, which are as perfectly emptied when at a speed of 10 feet as when running at 70 feet per minute. Provision is made to prevent the breaking of the machine if from any cause the buckets should become caught, and the construction is such as to permit the easy renewal of those parts most liable to wear.

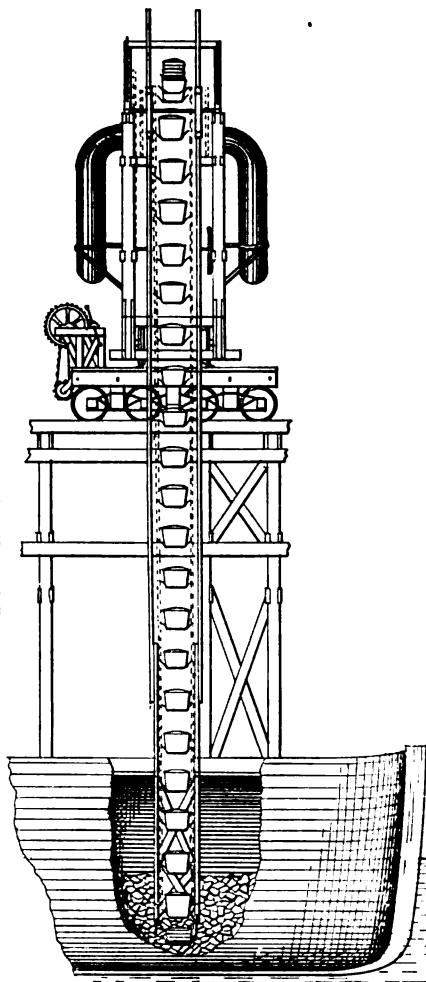
#### The Competition of Canadian Roads.

The recent inquiry at New York into the traffic methods of Canadian and American railroads by the United States Senate investigating committee elicited some important testimony. Charles Francis Adams, president of the Union Pacific, said the carrying trade of the road was strongly competed for between Denver and Cheyenne. As far as the opposition encountered from roads connected by steamships was concerned, Mr. Adams said it was a subject too big to go into. All the Pacific lines had steamship connections. "Time will settle the commercial problem on the Pacific Coast, as it has already settled it on the Eastern Coast," he said. "San Francisco is the New York of the Pacific Coast, and I don't believe its supremacy can be shaken any more than that of New York." Mr. Adams stated, further, that it was impossible to tell exactly what the effect of the Interstate Commerce law was on railroads. In some respects the law is good, in others it is crude. Some roads which have enforced it have lost business, but it would be different if all the roads honestly tried to enforce the conditions of the law. For the first time in the history of railroads the managers do not dare to reduce their rates, and shippers cannot get the usual low rates. The Canadian Pacific road takes a great deal of the American trade away. Mr. Adams was asked his opinion of the Canadian roads which build lines through the United States to act as feeders to their big trunk lines. He said that he did not see why they should be opposed. He favored a fair field and no favor, and if American roads were not able to compete with the Canadians, then they ought to go to the wall. He was not in favor of a free entry into the country by the Canadian roads, however. He knew of no remedy, but favored the suggestion that joint legislation by the United States and Canadian Governments might accomplish some good.

President Roberts, of the Pennsylvania road, contended that any foreign corporation doing business here should be subject

to the same laws as the roads of this country. It would be a fair demand that they should either conform to the laws of the country or stay out of it. A fair competition under proper legislation would be better than any pool. Mr. Roberts was in favor of pooling if only the different roads in the combination would keep their agreements.

President Van Horn, of the Canadian Pacific, when called to the witness chair, stated that his road, aside from the coal traffic, takes a very small percentage of traffic from the United States. Although the Dominion Government has granted a little over \$62,000,000 in subsidies and aid, it has not made any money. An object of the Imperial Government in sub-



Portable Coal Lift.—End Elevation.

dizing a steamship line on the Pacific is to have vessels there in the event of war with Russia.

The presidents of the Lake Shore and Michigan Southern and the Michigan Central roads were heard with special interest with reference to the Grand Trunk, which, they agreed in stating, has wonderfully increased its traffic out of Chicago at their expense, and this, too, in violation of the Interstate law.

President Smith, of the New York Chamber of Commerce, spoke of the lack of confidence in each other as a great source of trouble. If the Interstate Commerce law were rigidly adhered to it would be better than pooling as far as the interests of shippers are concerned. In regard to Canadian roads, he said they "are constantly increasing their amount of traffic between New England and Chicago, to the detriment of American roads, and it seems unfair to allow such advantages to the Canadian roads over the American lines. All we ask is that the foreign roads be put on an equal footing with our own.

Then we can fairly compete with the Canadian lines." The committee adjourned to meet in Boston July 5. To a reporter Senator Cullom said that he and his colleagues were very well satisfied with the information they had gathered. The committee was on a tour of investigation. It was not likely that the Interstate Commerce law would be soon amended at the instance of the committee, for the latter felt that the facts it had gathered and would gather were to be used rather for guidance when further legislation was asked for than as a basis for further legislation. The weight of opinions, so far, had been in favor of giving the law time to prove its efficiency. There was no thought of shutting out the Canadian roads, at any rate. More pacific measures would probably answer all purposes. Before the committee finished its labors it would obtain a fair conception of public feeling on the question at issue in the chief centers of the country.

#### The New Croton Aqueduct.

Eight lines of 48-inch iron pipes, advancing side by side from 125th street toward Central Park, show that the new Croton Aqueduct approaches completion. The aqueduct proper is, in fact, finished save for a little brick-work, and a tunnel more than 30 miles long extends to Croton Lake, 5 miles northeast of Sing Sing. The aqueduct starts out in horse-shoe form, with a capacity equivalent to a cylinder 14 feet in diameter. This form is maintained to Jerome Park, where a great reservoir with a capacity of 2,000,000,000 gallons is to be constructed. Thence the aqueduct is a cylinder 12 feet 8 inches in diameter. The tunnel is from 40 to 400 feet below the surface. It dives under the Harlem at about 179th street, between the High Bridge and the new Washington Bridge. The tunnel's depth beneath the stream is 300 feet. The stream once cleared, the tunnel rises vertically to within about 100 feet of the surface and runs southward to 135th street. Here a gatehouse is built, and into this the pipes from the old aqueduct will be turned. The new aqueduct will leave a great volume of water at Jerome Park for the annexed district, and then pour the remainder into Central Park reservoir. The total capacity of the two reservoirs is more than 400,000,000 gallons in 24 hours. This is more than the summer output of the Croton River, and unless storage reservoirs are constructed in the Croton Valley New York will have, as an engineer has happily said, "a big spout and a small kettle." The question of storage reservoirs is unsettled. One plan contemplates several small basins; another the great Quaker Bridge Dam.

The aqueduct has been four years in building and cost about \$15,000,000. At several points "blow-offs" have been constructed, so that the water may be discharged preparatory to cleaning or repairing, and at other points vents are made so as to provide for automatic relief in the case of sudden pressure. On the west bank of the Harlem a great pump will extend to the lowest point of the tunnel, so that the portion under the river may be emptied.

A machine for cutting down trees is said to be coming into vogue in Oregon. It is run by electricity, and, unlike steam machinery, can easily be moved about in the woods, as the motor is placed on a high cart and runs a cutting drill, which sweeps from side to side, and is advanced as the work progresses. The electricity can be supplied from a stationary steam-engine or a water-power, and conducted by insulated wire to any reasonable distance or over any kind of ground.

### The Lake Superior Iron-Ore Trade.

A correspondent of the New York *Herald* furnishes a very exhaustive report of the condition and prospects of the Lake Superior iron-ore mines, of which the following is an abstract:

The outlook for the mines for the present season is fairly good. A certain amount of ore must be used this year, and the Lake Superior mines must furnish a very large part of it. It is certain that more ore will be mined this year than last, and it is almost certain that 5,500,000 to 6,000,000 tons will be shipped by the mines of the four ranges. Nearly or quite 1,000,000 tons of this ore will be taken by Western furnaces. The balance will go to Ohio, Pennsylvania and New York. The mines may not make as much money as in years past, but they will all make something.

In the line of new mines the Vermillion range will make the best showing this year. In the Gogebic district few new mines will come to the front this year. The same is true of the Menominee range. In the Marquette district the Queen, South Buffalo and Prince of Wales mines on the East Negaunee range will come to the front as ore producers, and the East New York Mine, of Ishpeming, and Riverside, of Republic, promise to develop into large mines in a short time. There are a number of explorations, such as the Norwood, East Jackson, Kilworth, North Republic, &c., that will mine some ore each this year. The Hamilton Ore Company, of Iron Mountain; the Marquette Ore Company, of Ishpeming, and the Republic Reduction Company, of Republic, are all getting ore by the simple means of sorting over the waste dumps of big mines and shipping the good ore thus obtained. They will market from 10,000 to 30,000 tons each this season.

The Marquette is the oldest of the four ranges and still the principal seat of ore production. The present year will see a larger amount of ore taken out than ever before, and for the first time over 2,000,000 tons of ore will be mined, sold and shipped by Marquette County mines. This immense amount of ore will be raised from 45 mines, and they will mine all the way from a few hundred tons to nearly 300,000 tons each. Twenty-five mines will produce nine-tenths of the ore raised.

The mines of the Menominee range will produce between 1,250,000 and 1,500,000 tons of ore this season. The Dunn, a new mine, but a big one, will get out 200,000 tons; the Norway, 100,000 tons; the Vulcan, 125,000 tons; the Chapin, 300,000 tons; the Iron River, 125,000 tons, and the Florence, 150,000 tons, leaving a quarter to half a million tons to be produced by the 30 other mines of the range. The output of the Chapin Mine may exceed 300,000 tons, as it has produced 336,000 tons in one year, but the condition of the mine is such that it is not probable that the 300,000 figure will be passed.

The mines of the Gogebic range have suffered much on account of the big boom and the reaction that followed, but the district is recovering and can show some good mining properties, prominent among which are the Colby, the Norrie, the Aurora and the Ashland. There will be 35 or 36 producing mines in the Gogebic this year, perhaps a few more before the close of the season, and they will mine and place on the market 1,500,000 to 1,750,000 tons of ore this season. The smallest mines of the range are laboring under many disadvantages, principal among which are a lack of capital and the disinclination of moneyed men outside of the district to invest in anything bearing the name of Gogebic.

In the Vermillion district the Minnesota Iron Company shipped 400 tons daily to

Western furnaces during the winter by all-rail routes, and consequently have made a big start on shipments for the present year. The same company have already sold 600,000 tons of ore for this season's delivery. The balance will go to other points. The Chandler Mine is good for the production of at least 250,000 tons more, and the Pioneer will ship a few thousand tons. Several smaller mines may make slight shipments before the close of the year. It is safe to predict that the Vermillion mines will produce at least 875,000 tons of ore this year, and may mine nearly 1,000,000 tons. The principal properties on which explorations have shown ore and on which work is now being done are the McComber, James & McComber, Zenith, Garden Lake, James & Longstorf, Adams, Bole & Meggins and Minnesota Exploration Company. The Minnesota Iron Company are, of course, doing a large amount of exploring work all the time. The Vermillion district is being rapidly developed, and there is a prospect of another railroad reaching the district, which will facilitate matters there.

Freight charges for lake transportation of ore are as low as last year, and lower than in 1886 and 1887. Over 800,000 tons of ore have already gone forward from five shipping ports of the Lake Superior district this season. Instead of waiting until October to begin heavy shipments the mines are rushing their ore forward as early as possible. The saving to the mining companies on transportation alone will amount to millions, unless freights are arbitrarily raised early in the season by the vessel men. In the fall, when wheat shipments from Duluth grow heavy, ore shipments will slack off. Mine owners have learned from experience that it pays to be prompt in getting their ore to the receiving ports, whence it is distributed to the furnaces.

Wages of miners are lower this year than last. There has been a considerable decline in wages within the past few years, and miners now earn from \$1.75 to \$2.25 per day on the average. Miners' wages are higher than in the Eastern mines or in the Lake Superior copper mines, and lower than in the Far West. All the men needed, some 18,000, are now at work, and there is no apprehension of strikes or industrial troubles of any sort during the present season.

The best-informed mining men do not expect a return of the "good old times" of ten years ago, when iron ore was selling at \$9 and \$10 a ton and \$500,000 dividends were paid annually by the big mines. Southern pig-iron and the great increase in ore production caused by the opening of the Menominee, Gogebic and Vermillion districts have reduced prices, and they will stay down.

**The Post-Electric System.**—It is declared to be entirely feasible to dispatch the United States mails by electric power between points as far separated as New York and Boston in two hours. John T. Williams has invented a post-electric transportation car, constructed of light steel, which passes through a series of box-like frames resting upon a single rail, and in the model exhibited a car containing 1000 letters could be sent out from New York or Boston, for example, every five minutes. The manner of propelling the car is described as follows: "Assuming the front of the car to be the S-pole, like that of the simple bar of steel or iron, as it is drawn into the center of the helix it repels the S-pole of a pivoted magnet in the upper part of each helix, forcing it upward, and bringing the end-pole down in such a way as to make the circuit. This closing of the circuit through the helix tends to draw the car in with a sucking action. The contact of the end-pole of the magnet with the closed circuit is maintained up to

the time that the center of the carriage arrives at a short distance from the center of the magnet, when the influence of the carriage on the magnet becomes neutralized and the contact is broken. This making and breaking of the circuit is thus repeated as the car enters and passes through each succeeding coil." In the model the car is about 4 feet long and weighs about 56½ pounds, but the dimensions could be increased, with a corresponding capacity for transportation. The power of the proposed system is 110 volts.

### The Northwest Empire.

The vastness of Alaska is the theme of ex-Governor Swineford, who made a journey of 10,000 miles within the limits of the territory, and proposes to write a book which is likely to be the standard Alaskan authority. "When I sat at my desk in Sitka," said Governor Swineford while on a recent visit to Washington city, "I was further from Attu Island, the westernmost point in Alaska, than I was from Portland, Me. This may serve to give some idea of the prodigious distances of Alaska. But I can furnish a more striking one. If the capital of the United States was located in the center of the United States—that is to say, at a point equi-distant from Quaddy-head, Me., and Attu Island, Alaska—it would be in the Pacific Ocean some 600 miles north by west of San Francisco." It has long been said that the sun never sets on the British Empire. But it is not generally known that it is equally true that the sun never sets on the domain of the United States. It is shining in the Aleutian Islands while it is the dead of night on Martha's Vineyard. The United States laps nearly half-way around the world. It extends from 67° west longitude to 169° east longitude. Alaska has between 800,000 and 900,000 square miles of land surface, and has also a great water area. It is nearly as large as the United States east of the Mississippi. Governor Swineford thinks there are now about 50,000 people in Alaska, at least 30,000 of them natives who are wholly uncivilized. Under the existing anomalous form of local government no taxes can be levied in Alaska for any purpose whatever; consequently there has never been any enrollment of real or personal property for the purposes of taxation. No portion of the general land laws having as yet been extended over the whole or any part of the Territory aside from a few mining claims either lately patented or for which applications for patents are pending, there are only 21 fee-simple titles in the whole of Alaska, and these do not embrace 100 acres in all. The property which could be taxed is at present, therefore, almost wholly personal, and will continue to be so until Congress by the necessary legislation makes it possible for claimants to secure titles to lands now occupied by them and upon which improvements have been made or placed to the aggregate value of millions of dollars. But placing a fair value on the mines already in operation and those in process of development, and all property usually subject to assessment in the States and Territories, there is \$15,000,000 of taxable property in Alaska, exclusive of the seals, which belong to the Alaska Company.

It is claimed by those who are familiar with the use of wire ropes that proper attention is not given to them. A very common practice is to use paint or tar as a covering to preserve them from the action of the atmosphere, but in spite of this dampness penetrates between the strands, rusting commences, and sudden collapse is a frequent result. A grease in which is incorporated the best lubricating graphite is a material strongly recom-

mended by superintendents of mines and by manufacturers of wire ropes. The grease prevents the wire from rusting, and the graphite, finding its way into the minutest spaces, lubricates the strands and protects them from abrasion

### Making Steel in India.

In forwarding to the Government Central Museum samples of steel manufactured at a village in the Trichinopoly district, together with the ordinary earthenware crucibles used in the operation, the Board of Revenue has also furnished the following communication from the collector of the district on the method of manufacture, which is printed in the *Indian Engineer*:

The industry is carried on at a small village called Venkatanaikampatti, about two miles from Parvarankurichi, occupying a favorable situation for obtaining charcoal from the surrounding hills of the Marangapuri Zemindari. It affords employment for about 16 families of smiths and is altogether in the hands of a Musulman named Mahomed Routhen, who holds a monopoly of the right to collect charcoal for the purpose in the jungles of the estate, for which he pays \$4.50 per annum. Beyond the convenience of its situation as regards the jungles and the existence of tolerably fine sod earth in the vicinity, the site possesses no special advantage.

The process employed is very simple. Small quantities of iron are inclosed in a small earthen crucible with a few pieces of the wood of the avaram plant and two or three green leaves. A top is luted on, and when dry the whole is exposed to the heat of a small charcoal furnace till the iron is melted, a fact which the operator ascertains by picking up the crucibles in a long pincer and shaking them. The vessels are allowed to cool and then broken open, when a knob of steel is found at the bottom. Two sizes of ingots are made, weighing about 8 ounces and 10½ ounces, respectively. The crucibles are made of a mixture of red earth and charcoal made of paddy husks kneaded together. They are shaped on a wooden plug about 5 inches long and 2 inches in diameter for the smaller size of ingot and slightly larger for the other size, having a conical end, which forms the bottom of the cavity in which the steel collects while fluid. The lid is of the same material and put on wet. It appears hardly to contract at all in drying, and a fairly air-tight vessel is consequently produced. The clay is not nearly refractory enough for the heat it is exposed to, as the crucibles are completely vitrified and spoilt at the end of a single operation.

The iron used is brought from the Namakal Taluk, of Salem, and appears to be a rough description of wrought iron. For the smaller size of ingot it is cut into pieces weighing as nearly as possible 10 ounces (a small piece is added to make up the weight if necessary), and this quantity is placed in each crucible with ¼ ounce weight of pieces of the dry wood of the avaram plant. Two or three green leaves (the kind is a matter of no consequence) are placed on top, and the charge closed up with a lump of clay carefully plastered all round. Great care is taken in putting in the correct proportions of iron and avaram wood, and the operators assert that if less is used the iron is not melted, and if more it will not stand being worked afterward. The green leaves probably serve in some way toward retarding the drying of the lid and preventing it from cracking.

The furnace consists of an inverted cone of earthwork about 2 feet in diameter and the same in depth, the apex opening into an ash-pit below. At one side, and pro-

tected from the heat by a mud wall, is a small shed in which two bellows-men sit and work a couple of skin bellows most vigorously. The air is admitted into the furnace through a hole near the bottom. In preparing a furnace, some straw is first placed at the bottom below the air-hole, and charcoal is then thrown in to a suitable height. On this 25 of these conical crucibles are placed with the points downward, and when all are in position they appear to form a sort of circle and to be independent of the layer of charcoal below. More charcoal is placed above, and the furnace is then lighted through the air-hole. Fresh fuel is thrown on above from time to time, and one or two of the crucibles are occasionally lifted with long-handled pincers to allow the burning charcoal to fall through and replenish the supply below. The straw remains untouched by the fire throughout the process. The crucibles are given a sharp shake on these occasions, which is said to assist the process and toward its conclusion allows of the operator's ascertaining whether the iron is melted or not. As the mouth of the furnace is open the waste of fuel is enormous, and I do not believe that one-fourth of the charcoal used exercises any effect on the crucibles. In the absence of good fine clay this fault seems irremediable, as there is no sufficiently refractory material available from which a separate opening for the supply of charcoal to the furnace below could be constructed.

After about an hour or an hour and a half the feel of a crucible when lifted shows its contents to be liquid. The process is then considered to be completed and the crucibles allowed to cool, after which they are broken open, a knob of steel being found at the bottom of each. The ingots are reheated and hammered into oblong pieces, in which shape they are sold. All the crucibles do not remain absolutely air-tight during the process, the lids becoming cracked without affecting the result. I had the contents of one of these poured out through a crack, and was surprised to find the steel in a state of extreme fluidity—a thing which the heat produced hardly led me to expect. The estimated cost of making 200 pounds of steel is about \$13.95, and the value realized for the produce about \$16.20, the manufacturer netting a profit of \$2.25. The annual output of the manufacturers in the village is about 28,000 pounds.

### Ventilation of London's Under-ground Railways.

The unventilated condition of our under-ground railways is, says the *London Times*, a matter of public notoriety, and the sulphurous fumes emitted from the locomotives doubtless deter many from using those otherwise excellent means of transit. It is true that an attempt was made some years since to mitigate the evil by making openings at various points along the line of route of the Metropolitan District railways through which the obnoxious vapors are now largely discharged. It is true also that on the Metropolitan Railway there are a few openings which slightly relieve the tunnel of the products of combustion. The fact, however, remains that our under-ground railways, in spite of their blow-holes and street disfigurements, are a source of great discomfort, if of nothing worse, to passengers using them. Numerous projects have been devised for remedying this evil, but none appear to have been found sufficiently practical for adoption. We have, however, recently inspected a system of extracting the noxious vapors from a locomotive directly they are formed, and of discharging them into the air, which appears to meet the case of under-ground railways, inasmuch as these vapors never

enter the tunnel at all. This system is the invention of Mr. Chris. Anderson, of Leeds, and the desired object is accomplished by making a connection between the smoke-box of the moving locomotive and a stationary exhausting flue by means of a long sliding box placed under the locomotive, and working with its open under side in contact with the upper surface of the flue. The flue is fitted at intervals with valves, over which the sliding box travels, and which are opened by it, the box being of such a length as to enable it to cover a second valve before it has quite passed over the previous one. The flue is placed in the center of the road between the rails, and is exhausted by fans situated at intervals along the line and driven by stationary engines. The exhausting-fan having been set to work and the train started, as the locomotive passes over the valves the steam and products of combustion are sucked from the engine through the valves in the exhausting-flue, and are drawn from it and discharged into the atmosphere through suitable shafts. By this means it is claimed that the fouling of the atmosphere of under-ground railways by the products of combustion would be entirely prevented without any prejudice to the working of the traffic or detriment to the running of the engines or trains. A working model of this invention was recently inspected by us, as applied to a 60-foot length of line, and the feasibility of the system was, so far, fully demonstrated. In view of the very objectionable condition of our under-ground lines as regards ventilation and of the simple character of the present invention, it would seem desirable to test its efficacy on a short length of line to start with.

The New Birmingham Iron and Land Company, of New Birmingham, Tex., are making vigorous efforts to build up that new iron-making district. They have recently issued a circular calling attention to the advantages of the town which they are building for the location of manufacturing enterprises of varied character. The company are building a 50-ton charcoal furnace, which is nearing completion and which will be an entirely modern plant. They have also erected a hotel, which is described as one of the handsomest hotels in Texas. A \$25,000 electric plant has been established for the illumination of the town, and a charter has been granted for a company proposing to build an electric street railroad. It is estimated that nearly 200 houses have been built or are nearly completed. A planing mill, three brick-yards with modern machinery, and a wagon factory are some of the industries already completed and at work. The first sale of lots made in this town occurred on November 12, 1888, at which time not a house had been built upon the town site. The growth of the town up to the present time is regarded as phenomenal, and it appears that this will be one of the important business centers of the South if the hopes of its projectors are realized, of which there now seems to be a reasonable certainty.

A German company—the Bochumer Verein—has secured the order for the construction and equipment of Ferntree Gulley Narrow-Gauge Railway, Victoria, at the price of £22,000. It is claimed on German authority that this is the first occasion upon which German contractors have been concerned in the construction of a railway in Australia. The Bochumer Verein had exhibited its system of narrow-gauge railways in the recently closed International Exhibition at Melbourne, and it is to this circumstance that the success in carrying off the order mentioned may be attributed.



### The Taylor Revolving-Bottom Gas Producer.

A gas producer is about the simplest of all metallurgical furnaces—in fact, almost anything capable of containing a heavy bed of coal under which a blast of air, or air and steam, can be forced is a good gas

producer. 12 years, W. J. Taylor designed a solid circular bottom or table arranged to revolve in the lower part of the producer; the revolving of this bottom discharges the ash and clinker over its edge into a sealed ash-pit beneath. This device, all the practical details of which were worked out at the Chester Furnace, at Chester,

noticed that the lower part of the ash-chamber is of smaller diameter than the producer proper. This reduces the size of the revolving table and also the diameter of the casing of the lower part, besides requiring less power to grind. An iron hopper is used to form the walls of the lower part of the ash-chamber and an annular space is thus formed between the hopper and the outer casing. Doors are provided in the casing and punching holes through the iron hopper, both for observation and access to the bed of ash, with bars for breaking up clinker that is too large to pass through the 9-inch space between the bottom of the hopper and the revolving table. The grinding is done as fast as the ash accumulates too far above the central air and steam discharge, say every six to twenty-four hours, according to the rate of working. The door of the ash-pit is opened once a day for taking out the ash and clinker. This requires but a few moments and interferes but little with the continuous working of the producer.

The conduit for air and steam acts as a central post or support on which the bottom revolves, actuated by a crank and pinion. The injected air and steam are discharged radially from the center, in order to prevent too much travel of the gas next to the walls, which is the line of least resistance. It enters at a point sufficiently high to carry the required bed of ash, which should never be brought below the air discharge. Sight or test holes are placed in the wall, so that the dividing line between the ash and incandescent coal can be ascertained at any time. It will thus be seen there is no grate to waste coal through, and there is practically no waste in cleaning. In practice the carbon is gasified down to less than one-half of 1 per cent. of the original carbon in the coal. Cleaning or discharge of ash is under the control, even to passing large clinker, without any disturbance or manipulation, or interference with making gas. The producer is therefore continuous (it has been run for four months without stopping the making of gas), and at the same time it may be used intermittently. It is also simple of construction, consequently cheap and durable.

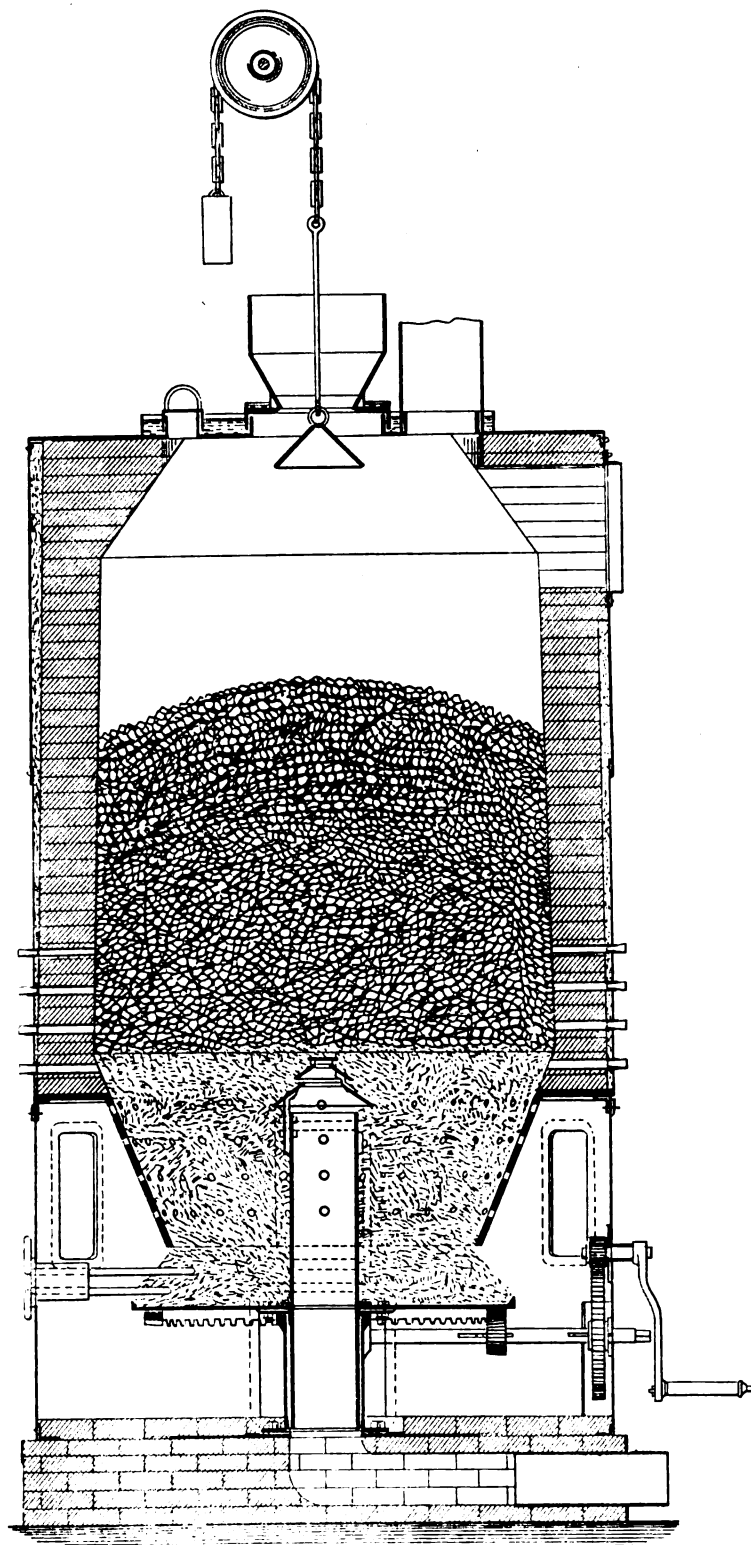
The blast is generally furnished by a Korting jet steam-blower, and the producer will usually carry more steam than the blower gives. One ton of anthracite buckwheat coal produces about 166,000 feet of gas, containing, say, 135,000 heat units per 1000 feet. The composition will average as follows:

Carbonic oxide.....	23.00 to 27.50
Hydrogen.....	15.00 to 10.50
Marsh gas.....	1.00 to 2.00
Carbonic acid.....	1.00 to 3.00
Nitrogen.....	60.00 to 58.00

Total..... 100.00 101.00

Gas made from bituminous coal has nearly the same composition, except that marsh gas is a trifle higher. The sizes now being built are 4, 5 and 6 feet inside diameter. They will gasify from 2½ to 5 tons and more coal in 24 hours. The producers are built much higher where soft coal is used, as a very much heavier fuel bed is necessary on bituminous than on anthracite.

American machinery manufacturers find the foreign demand for their products increasing as electric lighting becomes more general throughout the world. The new plant of the Spanish-American Light and Power Company, of Havana, Cuba, which is now in successful operation, obtains its power from one 13 and 22 x 13 (125 horsepower) and one 10 and 18 x 10 (65 horsepower) Westinghouse automatic compound engine. A 12 and 20 x 12 engine of similar construction is also being used as the motor for the electric lighting of the mammoth Theater Tazuela, at Madrid, Spain.



THE TAYLOR REVOLVING-BOTTOM GAS PRODUCER.

producer for a short time; but all those having practical experience in making either producer or water gas, from either bituminous or anthracite coals, know well the difficulties of getting rid of the ash and clinker in the coal without great waste, labor and loss of time, aside from making much poor gas. After contending with this difficulty in making producer gas continuously from anthracite coal for some

N. J., during an experimental period of over one and a half years, has since been successfully applied to heating furnaces of various kinds, sugar house kilns, pottery kilns, lime kilns, boilers, &c. It is being introduced by the Taylor Gas Producer Company, Brown Building, Philadelphia. The accompanying illustration represents this producer, of large size, designed for anthracite buckwheat coal. It will be

### The Aiken Hydraulic Crane and Tongs.

During the past few years a large number of American iron and steel works have been equipped with the Aiken hydraulic crane, designed by Henry Aiken, who is

is made of two I beams, which serves as a vertical guide for the plunger. It is stepped at the base so as to be axially rotated by means of the hydraulic cylinder *u'* and a rack and pinion. The cylinder *a* is provided with projecting lugs, *a'*, Fig. 1, which fit against the upright of

strains are taken by the plunger, which always rests upon a fluid cushion.

Mr. Aiken has also designed an ingenious method for handling steel ingots, our illustrations showing it as applied to soaking-pits or vertical heating-furnaces.

Two of the chains, *m*, Fig. 1, are at-

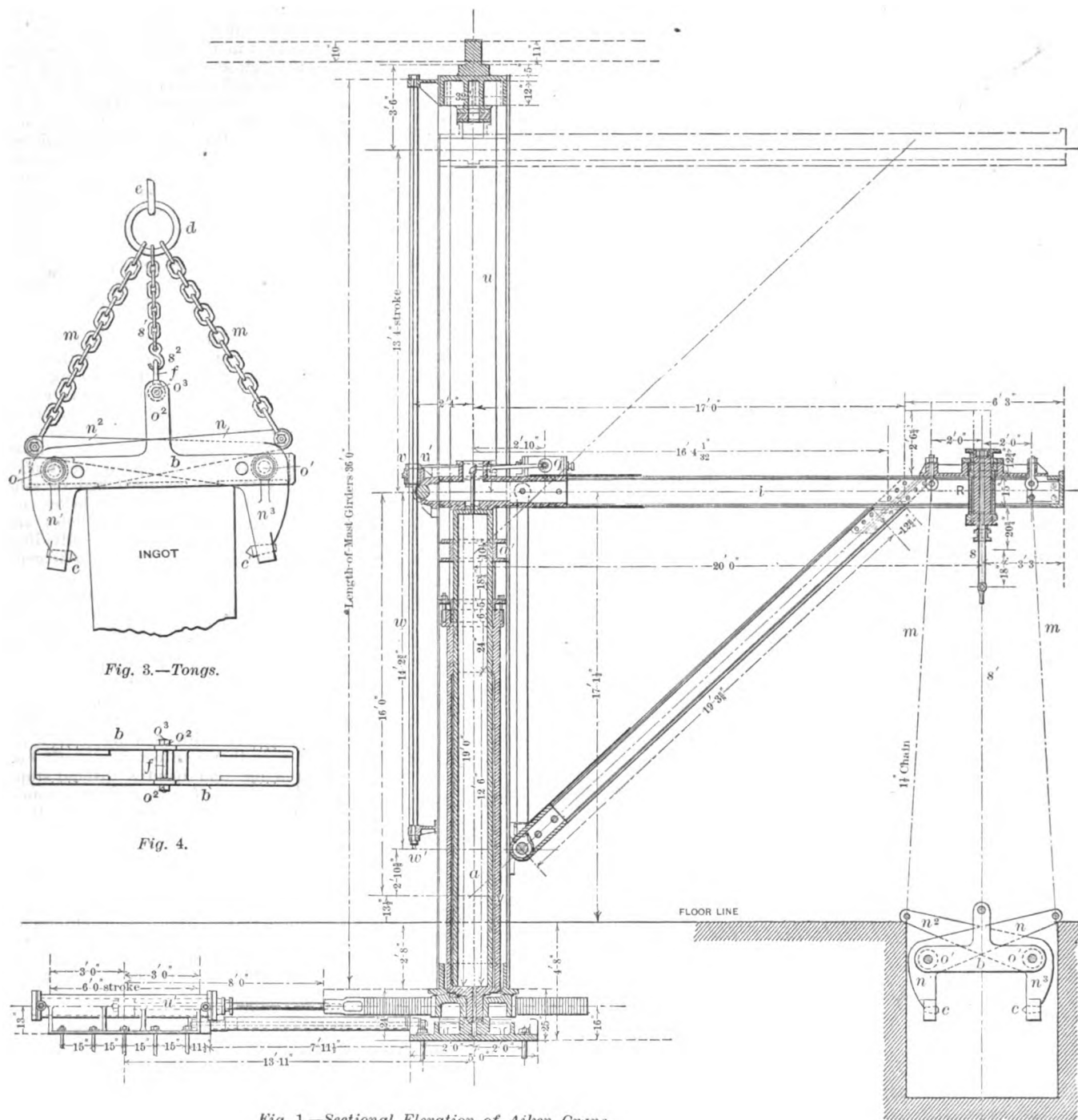


Fig. 1.—Sectional Elevation of Aiken Crane.

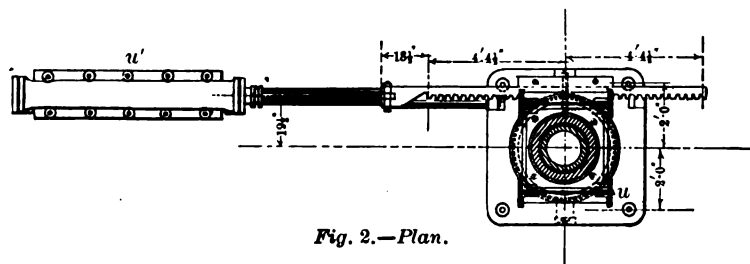


Fig. 2.—Plan.

### THE AIKEN HYDRAULIC CRANE AND TONGS.

connected with the Homestead Steel Works of Carnegie, Phipps & Co. Its characteristic features are shown in the accompanying engravings, from drawings of the crane as built for the slab mill of the Homestead Mill. It consists of an upright cylinder containing a hollow plunger *a*, the supply-pipe for the pressure water entering at the base. The mast-frame *u*

the mast-frame, so as to allow the plunger to move vertically without producing motion of the mast-frame and cause the plunger to rotate on its vertical axis within the cylinder when the mast-frame is turned. The jib *i* of the crane is set on the top of the plunger *a*, and moves vertically with it. The principal advantage of this construction is that all vertical

tached directly to the jib, and the other chain *s'* is attached to the projecting arm *s* of the plunger *S* of a hydraulic cylinder, *R*, which is set in suitable supporting brackets on the jib. The plunger of this cylinder is adapted to move vertically within its cylinder, which is supplied with water by a pipe which leads from the hollow plunger *a* of the crane along the jib

to the cylinder R, and is provided with a valve, *q*. The stem of the valve *q* is operated by a connecting-rod, *v*, which is attached to a crank-arm, *v*, of a vertical shaft, *w*, which is square or polygonal in cross section. The shaft *w* is journaled in horizontal brackets, *w'*, which project from the mast-frame.

The construction of the tongs with reference to that form which is shown in Fig. 1 may be described as follows: They consist of two lever-arms, *n n' n'' n'''*, which are bent into the angled form shown in the drawings, and for the purpose of enabling them to have a wider grasp are pivoted separately to a cross frame or bar, *b*.

The arms *n n' n'' n'''* are set in between the side bars of this frame, being pivotally secured thereto by bolts or rivets, *o'*, and the chains *m m* are attached to the ends of the arms *n n'*. At the ends of each of the parts *n' n''* of the tongs is a tooth, *c*, to enable the tongs to grasp firmly the sides of the ingot or other object intended to be raised.

The operation of the tongs is as follows: Normally the tongs hang from the jib of the crane, suspended by the chain *s'*, and the gravity of the arms *n n'* of the tongs is such as to cause the gripping portions or arms to remain spread, as shown in the drawings. When it is desired to raise an ingot which may be in a soaking-pit or furnace the crane is moved so as to bring the jib directly over the same, and the crane is lowered until the separating jaws *n' n''* lie on opposite sides of the ingot. The plunger *r* of the hydraulic cylinder is now lowered by exhaustion of the water from the cylinder by means of the valve *q*, the effect of which is to cause the weight of the tongs to be borne by the chains *m*, which, acting on the ends of the arms *n n'*, tend to raise them into an upright position, and thereby to close the jaws *n' n''* upon the ingot, and if the jib of the crane is raised these jaws, biting upon the ingot and clasping it firmly, will lift it from the pit. The jib of the crane may now be moved to carry the ingot to the place desired—for example, to the conveying-rolls or feed-table of a rolling mill—and when the jib has been lowered the tongs may readily be released from the ingot by admitting water into the cylinder R, thereby elevating the plunger *r* and causing the chain *s'* to draw upon the cross-bar or frame *b*. The effect of this is to take the weight of the tongs off the chains *m*, and the arms *n n'*, being thus relieved, will drop by gravity so as to disengage the jaws *n' n''* from the ingot. The tongs are thus released automatically, and may be removed from the ingot by shifting the position of the jib of the crane. By the saving of this labor it avoids the necessity of the workman approaching closely to the highly-heated ingot, and is otherwise a valuable and economical appliance. The tongs are susceptible of various modifications in construction and in the manner in which they may be operated. Thus Figs. 3 and 4 illustrate one of such modifications. In this form of the apparatus the construction of the tongs is similar to that shown in Fig. 1, except that the angular form of each of the arms *n n' n'' n'''* may be more nearly a right angle. The side bars of the cross-frame *b* are connected at the ends to give greater strength thereto. The chains *m m* and *s'*, instead of extending directly to the jib of the crane, may be attached to a ring or link, *d*, at the end of a chain, *e*, which is attached either directly to the jib or to a trolley thereon. The chain *s'* is provided with a hook, *s*, at its lower end, by which it may be detachably secured to an eye or ring, *f*, at the extremity of the projecting arm *o*.

The operation of this form of tongs is as follows: Normally the chain *s'* is attached to the eye *f*, and the weight of the

tongs, as it hangs from the crane, is borne by this chain, so that the arms *n n'* are free to drop by gravity and hold the jaws open, as shown in Fig. 3. The tongs may now be brought by movement of the crane directly over the ingot, and as the jaws are open the crane may be lowered to cause the cross-bar *b* to rest on top of the ingot and the jaws *n' n''* to straddle the same (See Fig. 3). If, now, the hook at the end of the chain *s'* be disengaged from the eye *f* the weight of the tongs is put upon the ends of the arms *n n'*, and if the crane be raised the jaws of the tongs will hold the ingot. When the ingot has been carried by the crane to the place desired, the slackening of the chains *m m* and the weight of the arms *n n'* will cause the latter to drop, so as to open the jaws of the tongs, and then if the hook at the end of the chain *s'* be attached to the eye *f* the crane may be raised or moved away from the ingot, the tongs being held open for this purpose by the chain *s'*. This form of the apparatus may not be so well adapted for some purposes as the form shown in Fig. 1, because it does not afford means for automatically closing the tongs; but as it is adapted to hold the tongs open, so as to enable them to be adjusted in position on the ingot without manipulation other than movement of the crane, it is of utility, as it dispenses with the work of pulling into position the tongs themselves, which may be of great weight, and requires only the inconsiderable labor of attaching or detaching the chain *s'* from the tongs. In some cases it may be desirable to render the tongs adjustable, so that they may have a wider or narrower grasp, in order to accommodate them to the size of the ingots to be carried. For this purpose the cross-frame *b* may be provided with several pairs of bolt-holes for the pivotal bolts *o'*, as shown in Fig. 4, and by setting these bolts nearer to the middle of the tongs the jaws may be brought more closely together and their width of grasp thereby adjusted. The pivots of the jaws may be brought as closely together as desired for the class of work which the tongs are designed to perform, and by suitable modifications in the form of the jaws it is possible to set both on the same pivot.

#### Andrew Carnegie on the Condition of Trade.

The New York *Herald's* European edition published the following interview with Andrew Carnegie on the 27th inst.:

"I am one of the delegates from the United States to the American International Conference which will meet in Washington next fall to consider the question of commercial and other relations. I want to make a study of the products of the countries of Central and South America to prepare myself to participate in the conference. I hear that the exhibits at the Paris Exposition are extensive, and so I shall have an excellent opportunity to get the knowledge I wish. I believe the conference will be one of the most important events of President Harrison's administration. Heretofore America has been unable to supply her own market, much less export; but just now the situation is novel. Prices which have risen and are rising in Europe have fallen and are falling in America.

"Steel rails recently sold in Pittsburgh as cheap as delivered in London by the English manufacturers—namely, £5 a ton. The prices we are getting for steel plates are about the same that prevail here. Hitherto English prices have depended on the American demand. Now the demands of the rest of the world, exclusive of America, together with the British wants, are sufficient to keep the manufacturers here busy. As long as this condition continues and prices keep advancing America

will be able to export to South American countries articles in which heretofore she has not been able to compete with Europe, so there appears now to be a great chance for America to establish more extensive commercial relations with her neighbors.

"It is a curious fact that the steel rails that Canada will require this season will in all probability be furnished by American manufacturers. I predict that such will be the case. This can occur only at times when European prices are high under great demands and American prices low under a state of depression such as now exists. It has never occurred before in my time, though once before we sold rails in Canada because the English manufacturers, by combining, forced prices up. The present situation results from natural causes and promises well for America."

"Would you use the same words in speaking of articles other than steel rails? Will America export them also?"

"Yes. Why, the day before I left home Senator Warner Miller told me he had exported a large quantity of paper to Liverpool to be used by a Liverpool newspaper, and that he netted as good prices as he received at home. But, understand me, this is not likely to be permanent, for whenever Great Britain's capacity to manufacture cannot be absorbed at home or abroad she will throw her surplus to America as heretofore. I read what ex-Mayor Hewitt said about the basic process. It is true that the basic process is the only one known which will make the ores of the South suitable for steel; but as long as Lake Superior is able to supply pure ore steel manufacturers will probably stick pretty closely to the present acid process. The basic process is good only as a substitute. I do not think that rails can be made by that process and sold for \$25 per gross ton, as they can now by the acid process."

"You and Mr. Hewitt do not seem to agree on the steel question."

"Well, he doesn't know. I do. I am not holding that the manufacture of rails by the acid process at \$25 per ton can continue profitably, for it cannot. Such prices are only reached by the throes of competition. But I do think that steel can be made by the acid as cheaply as by the basic process."

"Do you think America will share in the boom in manufactures which England is having?"

"No, I think not. The two countries have become much more independent industrially than formerly, and America must find within herself her conditions of prosperity."

**The Haytian Navy.**—Geo. B. Plumer, ex-Chief Engineer of the Haytian Navy, who recently returned to this country, reports that of the 18 American officers sent out by Minister Preston a few weeks ago, only a few escaped imprisonment on various pretexts, besides experiencing many indignities. The so-called navy he pronounces a burlesque. Although the men had signed a contract for six months' service, they were given the option of accepting half-pay for two months or nothing at all, as the Legitimate Government was virtually bankrupt. Advices from another source indicate the early triumph of the "North," which has a full equipment of arms, and is reported to have two fine gunboats purchased in the United States ready for action, both of the latter in command of officers well known in New York. Numerous surmises are afloat respecting the objects of the Washington authorities in sending a commission to Hayti. The acquisition of a coaling station would be a poor equivalent for an "entangling alliance." Perhaps a fair estimation of Hayti's population, all black or colored, is about 750,000.

### The Old Locomotive "Sampson."\*

At the Albion coal mines in Pictou County, Nova Scotia, may be found a curious collection of old machinery, notably three old locomotives, built by Timothy Hackworth in the shops of the Stockton and Darlington Railway, in England, in the year 1838. One of the locomotives referred to, the Sampson, was in use as late as the year 1882, is in a fairly good state of preservation, and as it is a good example of the first English locomotives, a brief description may not be uninteresting. As previously stated, it was built at the repair shops of the Stockton and Darlington Railway at New Sheldon, Durham County, England, and was brought out with two similar locomotives, in 1839, to run on a railway built for the Albion Mine to convey coal from its pits at Stellarton to Pictou harbor, a distance of 6 miles. The Sampson has three pairs of driving-wheels, coupled in the usual manner, and not differing very much in appearance from the driving-wheels of the modern "mogul" locomotives. These wheels consist of a cast-iron center and an outer rim, also of cast-iron, 12 wooden plugs being

original pins and brass bushes in the levers and sliding block are still in place, and show very little wear, after 40 years of almost constant use. The valve-gear consists of four eccentrics, attached to the axle to which the cylinders are connected; the eccentric-rods, extending up into the hood on the front end of the boiler, have forked ends which engage the pins of a rock arm, which is connected with the slide-valves; these eccentric-rods are controlled by the reversing lever, respectively engaging or disengaging them for the forward or backward motion, Fig. 1. The feed-pumps, two in number, are connected with the eccentric-rods, and were thus brought within the hood in full view of the driver; in fact, this arrangement of cylinders and valve motion gave the driver a convenient oversight of all the working parts of the engine while in motion, and without leaving his place; but, strange to say, he was compelled to go outside to ascertain the height of water or pressure of steam, the water-gauges and steam-gauge being located on the side of the boiler. The steam-gauge consists of a spring scale attached to the lever of the safety-valve. The pressure of steam did

air-brakes, &c., and delights to recount a feat of hauling a train of about 189 tons of coal out of a crooked siding on a wet day, which one of the Intercolonial Railroad engines failed to move. In reply to the writer's inquiry as to the effect of winter weather on the unprotected, cableless Sampson, the veteran replied: "Au' the rain an' wind an' snow for 40 year never made auld Donald Tampuson shiever yet." Further interrogation as to the care of his engine elicited the following: "'Deed an' I was far more carefu' o' her than of the gude wife.'" The sand-box of the Sampson consisted of two buckets of sand, one at each end of the locomotive, the sand being thrown by hand on the rails. This duty was attended to by the driver when moving ahead and by the fireman when moving backward.

How Great Britain is distancing all competitors is a subject viewed with complacency by the *Montreal Gazette*: "A glance at the United States navigation tables, the editor says, will show how greatly the British flag has monopolized the ocean carrying of the United States. Nearly half the tonnage carrying cargo between

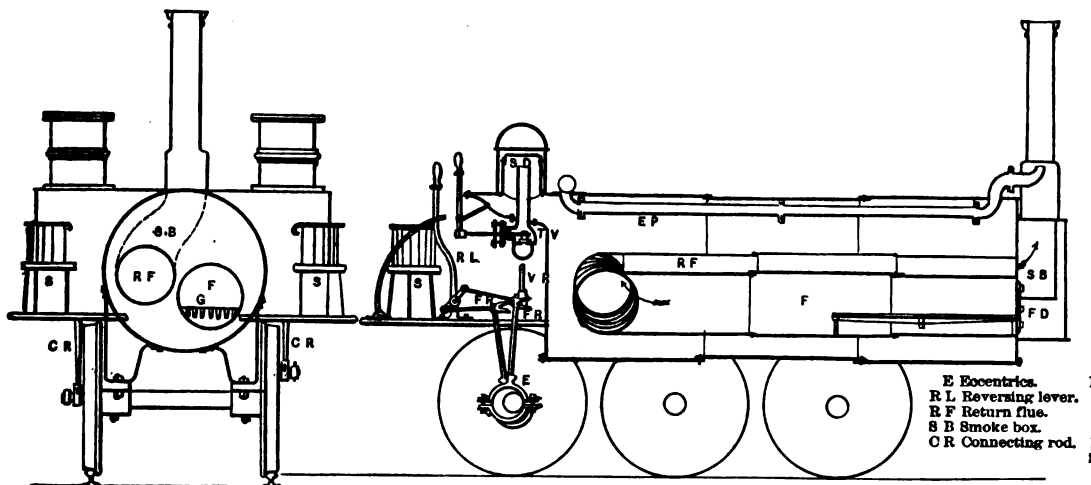


Fig. 2.

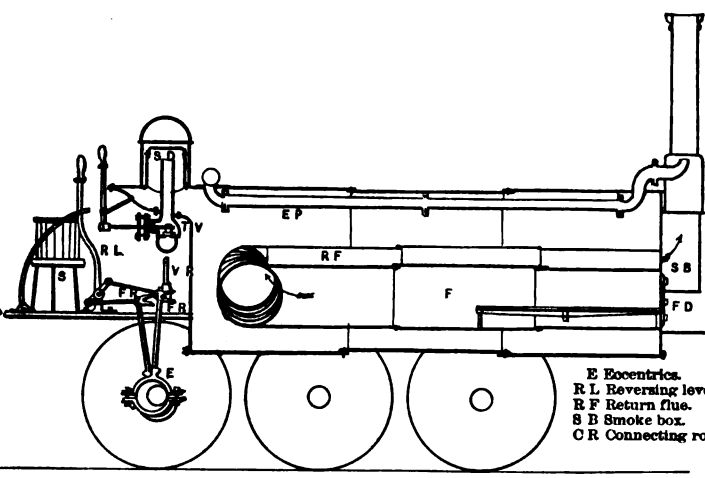


Fig. 1.

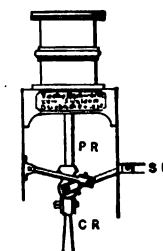


Fig. 3.

E Eccentrics. R.L. Reversing lever. R.F. Return flue. S.B. Smoke box. CR Connecting rod. FR Forked rods. TV Throttle valve. S Seats. G Grate. EP Exhaust pipe. SB Sliding block. VR Valve rod. SD Steam dome. F Furnace. FD Feed door. PR Piston rod.

### THE OLD LOCOMOTIVE SAMPSON.

driven between the center and rim to hold the rim in place. The tires are of iron or steel, shrunk on in the usual manner. The axles, which are 5½ inches in diameter, run in ordinary journal-boxes, bolted to brackets made of boiler-plate, which are riveted to the shell of the boiler, Fig. 2. The boiler is a plain cylindrical shell, 54 inches in diameter and about 18 feet long, containing a single return flue 20 inches in diameter; one end, being fitted with grates, was used as a furnace. The products of combustion following the flue to the front end of the boiler were then returned direct to the smoke-stack, which is at the rear end of the locomotive, Fig. 1. The cylinders and driving-gear are at the front end of the locomotive, and the driver's place was at the front, so that he could keep a good lookout ahead. The fireman was stationed at the rear.

The cylinders (15½ inches diameter by 18-inch stroke) are vertical, resting on cast-iron box-like frames, forming part of a bonnet or hood which partially incloses the valve-gear, pumps, throttle and reversing levers and other working parts. The cross-heads, instead of being guided by slides in the ordinary way, have an arrangement of levers and sliding block, Fig. 3. That this device caused very little friction is shown by the fact that the

not exceed 40 pounds, the spring scale being graduated to 50. The exhaust steam after leaving the cylinders was conveyed within the shell of the boiler, Fig. 1, to the smoke-stack. The reason for thus reheating the exhaust steam is difficult to understand. Probably the idea was that the heat of the exhaust could be utilized within the boiler, the designer overlooking or not clearly understanding the higher temperature of the live steam within the boiler.

That the engineers of that date (1838) had to some extent grasped the requirements of locomotive construction may be gathered from the many devices made use of in this early representative of the "species locomotive" which are still in use, such as the three pairs of coupled driving-wheels, placed as near together as possible, the center pair being without flange, the forced draft obtained by means of the exhaust in the smoke-stack, and the cylinders connected outside the frame.

One of these locomotives was driven by George Davidson, who worked on them while being built in England, and came out to Nova Scotia with them in 1839; he is therefore one of the oldest, if not the oldest, locomotive driver in America. He is still hale and hearty and tells many reminiscences of his 40 years on the rail. Donald Thompson, a "canny Scot" and another faithful veteran, scorns the modern locomotive, with its complicated gauges,

the Argentine Republic and the United States was under the British flag, and there was not a single vessel flying the Stars and Stripes engaged in this trade in 1888. In the trade between Germany and the United States the Stars and Stripes floated over not one steamship, Great Britain and Germany doing the greater part of it. The trade between England and the United States was participated in by 100,000 tons of steam shipping flying the Stars and Stripes, while the Union Jack floated over 8,044,000 tons of English steam shipping engaged in the business. In the trade between England and Scotland there was not a single United States steamship, all but a small fraction being done by vessels carrying the British flag. The same experience is with Ireland as with Scotland. In the trade between Brazil and the United States 61,000 tons of steam shipping were American, while 164,000 tons were British. So whether we study the North Atlantic trade generally, the trade of the United States with other countries on this continent, or the trade of the United States with Asiatic countries, the same fact of British supremacy stands out prominently." It is a trite remark that it is sometimes profitable to see ourselves as others see us.

At the New York Custom House Collector Erhardt is putting all employees handling money under bonds.

\* Paper read by D. W. Robb, of Amherst, N. S., at the Erie meeting of the American Society of Mechanical Engineers.



## THE WEEK.

The freight house, wharves and other terminal arrangements of the Housatonic Railroad at Wilson's Point, Conn., on the line of the contemplated direct through route to New York, were entirely destroyed last week, excepting the floating dock, which had not yet been used. The loss is serious, but the work of restoration will begin at once. Estimated loss \$200,000.

Origen Vandenberg and other parties interested in the proposed under-ground railroad in this city have no exclusive rights to construct and operate the road, independent of the authority of the municipal corporation. So decides Judge Truax, of the Supreme Court, in a suit brought to test the binding force of a former judgment favorable to the under-ground scheme.

It should be noticed that forcing steam into the hold of a vessel for the extinguishment of fire, as was done on the British steamship *Rugia*, is an American idea, made compulsory under the Revised Statutes of the United States, section 4470.

The high speed recently recorded in the performance of some of our first-class ocean steamers is gained at an enormous cost. The *Augusta Victoria* "used only 220 tons of coal a day," so the account reads.

For the protection of vessels during the prevalence of heavy fogs no adequate means have yet been devised, as lately shown in the lamentable fate of the New York pilot boat *Charlotte Webb* when run down in this harbor by a French steamer. The rescued men declare that they used flash-lights, rockets and fog-horns, but to no purpose. It is thought that the use of a suitable signal-gun would answer the purpose better than the present devices.

Several schemes contemplating improvements in Persia, including a bank, railway, water-works and electric lights, have been organized under the laws of the State of Maine, by Frank Clergue, each with \$1,000,000 capital, and the author hopes to secure for them a successful introduction.

The iron centers of Alabama will be connected with Mobile by a new railroad shortly to be commenced by a company with \$2,000,000 capital, thus securing a short outlet to the sea.

The pioneer steamship, with men and materials to commence the actual work of construction on the Nicaragua Canal, sailed from this port on Saturday. The resident engineer at Greytown, F. P. Davis, will establish his headquarters at that point. The cargo comprises every variety of stores, such as provisions, roofing materials, nails, hardware, &c., also a dozen or more iron boats, an exact counterpart of the native craft except as regards material.

A committee of the Illinois State Penitentiary Commissioners, who were instructed by the Legislature to inquire as to the feasibility of assisting the farmer in his fight against the binding twine manufacturers, report that a plant that would employ 75 convicts could manufacture one-third of the twine used by the farmers of the State at a cost of 11½ cents per pound.

In 1832 the Morris Canal, then one of the greatest works of civil engineering, was opened for business between Phillipsburg, N. J., and Jersey City. It enhanced the prosperity of the country through which it runs largely and rapidly. Even after railroads began to extend across and hither and thither through that part of

New Jersey, the canal continued to prosper and benefit the industries it had called into being. It passed finally into the hands of the Lehigh Valley Railroad Company, and has been kept in operation regularly during the water transportation season. The announcement is now made, however, that the old canal, after nearly 60 years of existence, is to be closed, as last season the business it transacted did not pay its running expenses.

Ten English workmen who came to this country under a labor contract, landing in New York, were sent back by Collector Erhardt. They were discharged convicts.

The Ordnance Bureau of the Navy Department has completed two of the 10-inch steel breech-loading rifles for the monitor *Miantonomoh*. These are the largest and most powerful built-up guns yet turned out for the navy. One of them is at Annapolis awaiting trial. The other has been fully tested with gratifying results.

The Government's net holding of silver dollars unrepresented by certificates in circulation decreased to about \$8,000,000 in January last. Since the latter date the accumulation of silver has gone on, and at the present time the coinage is at least \$10,000,000 in excess of the certificates issued. The question, therefore, becomes pertinent whether the limit of possible absorption has not been reached.

The steamship *Cynthia* was sunk in the St. Lawrence River, near Montreal, by a collision with the *Polynesian*, and the latter was saved only by her strong iron bulkheads and water-tight compartments.

For aught that appears to the contrary, the steamer *Alaskan*, which recently foundered on the coast of Oregon, had no other "structural weakness" than might become apparent in any steamer designed for sound or river navigation if exposed on the open sea. The reputation of the late John Roach, her builder, is in no wise affected.

New oil line projects are multiplying. the idea of manufacturing both fuel and illuminating gas from the crude material affording the incentive. An 8-inch pipe line is now being laid from Parker, Pa., to Signet, Wood County, Ohio, where it will connect with the Lima line running to Chicago. From Parker a 6-inch line will be laid to Coal Grove, McKean County, Pa., where it will connect with a 6-inch line already laid to New York City. It is said the oil will be pumped from the Ohio field to New York, where gas will be manufactured from it to supply the city with fuel and light. Another phase of enterprise is the absorption of gas companies by syndicates proposing to introduce natural gas as a substitute. Closely following the purchase by Eastern capitalists of all the gas companies in St. Louis, those of Rochester, N. Y., have in like manner been seized upon by a syndicate in New York, who propose to introduce natural gas from the Pennsylvania fields, 100 miles distant, and it is intimated that Buffalo, Elmira and Syracuse may eventually be supplied from the same source.

During April there were 62,605 immigrant arrivals at the ports of the United States, against 79,670 for the corresponding month last year.

Those interested in marine architecture will have a rare opportunity for observation during the process of building the new cruiser *Maine* at the Brooklyn Navy Yard.

All the silk looms in Paterson, N. J., are reported to be actively employed. The operatives number about 2000.

Capt. C. G. Lundborg wrote in 1882 that "it is beyond dispute that the maximum efficiency of the single screw propelling wheel has been already reached in sea-

going steamers. More propelling power, and its consequent speed, can be achieved only by the use of twin screws." This prediction seems to have been fully verified in the exploits of the City of Paris and other steamers propelled by the twin screw.

The steel rails for the new Mexican railroad from the Gulf of California to Chihuahua, on the Mexican Central, a distance of 220 miles, will be imported from Antwerp.

Brazos River, Texas, will be the new deep-water port on the Gulf, where railroads will center. The capitalists interested are vigorously at work.

The largest cargo of iron ore ever received in Philadelphia arrived by the steamship *St. Fillans* from Elba, comprising 3816 tons.

A new arrangement in lake and rail traffic has let the Canadian Pacific into Chicago. The line is from Vancouver by rail over the Canadian Pacific to Port Arthur, and thence to Chicago by the Lake Superior line of steamers. The rail haul is 1912 miles and the lake run 850 miles.

Proposals for the construction of three cruisers for the navy were on Saturday issued from the Navy Department. Bids will be opened August 1, 1889. These vessels are to be of 2000 tons displacement, and are to exhibit a maximum speed of at least 18 knots an hour for four consecutive hours. They are to be finished within two years from the date of contract, and payments will be made in 20 equal installments as the work progresses. The cost of the vessels, excluding any premium that may be paid for increased speed and the cost of armament, but including equipment, is limited to an amount not exceeding \$700,000 each. The proposals are divided into four classes, the first being for a vessel in accordance with the plans of the Secretary of the Navy, the second for the plans of the contractor, the third being for the Secretary's hull and the contractor's machinery, and the fourth for the contractor's hull and the Secretary's machinery. This last class is an innovation in naval advertisements.

The scrap-iron value of several vessels at the Brooklyn Navy Yard will soon be determined by an appraisal by Government officers appointed for this purpose.

The Hell Gate electric light tower, 265 feet high, and representing about 125 tons of structural iron, from Carnegie's works, at Pittsburgh, and which was erected by the Government in 1883 at a cost of \$20,000, has been doomed to the scrap heap. The electric glare only blinded the mariner.

Ten leading coal shippers of Pittsburgh engaged in the river trade to New Orleans and intermediate points have been consolidated into the Pittsburgh and Southern Coal Company, and propose to buy out all the little operators, their steamers and barges, coal mines and tipples, by an expenditure of about \$12,000,000, and secure a monopoly by which they can dictate prices to consumers. The river coal business is said to be much demoralized.

Three barrels of oil poured into the sea saved the United States steamship *Yantic* during the hurricane of May 21. Several officers agree with Ensign Ashman in stating that the oil had a wonderful effect.

The cruiser *Chicago*, it is reported from Washington, has been selected to carry the body of John Ericsson, the inventor, to his native land.

The French torpedo cruiser *Vantour*, just launched at Toulon, is expected to attain a speed of 20 knots, and the steel cruiser *Lalande*, launched at Bordeaux, is nearly as fast.

## MANUFACTURING.

### Iron and Steel.

Under recent date the Globe Mfg. Company, of Youngstown, Ohio, write us as follows: "We are now operating our fine hoop mill, making a specialty of the various sizes of fine hoops, rolled in about 1000 foot lengths and put up in coils hot, and may at some later day go into the manufacture of other sizes."

A charter was filed in Pittsburgh last week for the Pittsburgh Reduction Company. It is formed for the purpose of reducing refractory ores and producing bronze and commercial alloys. The capital stock is \$20,000, divided into 200 shares of \$100 each. The directors are A. E. Hunt, H. W. Lash, Robert J. Scott, Willard Hunsiker and W. S. Sample.

William Swindell & Bros., engineers and contractors, of Pittsburgh, have recently received a contract to construct three tube welding furnaces for J. C. Hodgson, of Montreal, Canada. The new plant will have a capacity of from 25 to 30 tons per day.

Sharon Furnace, at Sharon, Pa., operated under lease by Spearman, Collord & Co., was blown out last week. It has been turning out about 75 tons of metal per day. The lease expires in July next, and although the lessees have the privilege of renewing it at present terms, it is thought that they will not do it. The furnace is owned by Boyce, Rawle & Co., of Sharon, Pa.

The puddling department of the Terre Haute Iron and Nail Works, at Terre Haute, Ind., has been in operation only two weeks since April, 1888. The nail-plate department resumed operations a few weeks ago.

The plant of the Whitaker Iron Company, at Wheeling, W. Va., manufacturers of the Crescent brand of sheet-iron and sheet-steel, is being operated triple turn to its utmost capacity. A large addition to the galvanizing department is now under way, which is almost completed.

Lucy Furnace, No. 1, of Carnegie Bros. & Co., Limited, at Pittsburgh, was blown out last week after a very successful blast of 2 years, 11 months and 14 days. In that time it has cast over 192,000 tons of pig-iron. The furnace will be relined and otherwise thoroughly repaired, and will be ready for blast again about July 15 next.

The plant of the Oil City Tube Company, at Oil City, Pa., which has been running single turn for some time, was put on double turn last week. The report that a strike had recently occurred at the works is without foundation.

A charter has been issued to the Logan & Strobbridge Iron Company, of New Brighton, Beaver County, Pa. The capital is \$75,000 and the incorporators are: John H. Logan, Allegheny City; Turner Strobbridge, Big Beaver Township; Charles C. Robinson, L. Roggen Strobbridge and Persifer D. Hall, New Brighton.

The work of improving the Emma blast-furnace of the Union Rolling Mill Company, at Cleveland, Ohio, is well under way. The new smoke-stack, 152 feet high from the base, is completed, and workmen are now busily engaged on the new hoist-house. Work is going on day and night.

Owing to the depression in the iron market, and in view of the vast amount of iron now in stock at their various furnaces in the valley, the Columbus and Hocking Coal and Iron Company shut down on the 23d inst. their Winona and Buchtel furnaces indefinitely. This leaves the Bessie, at New Straitsville, and the

Hattie, at Greendale, the only furnaces now in blast in the valley. Four hundred men are thrown out of employment.

The Iowa Barb Wire Company, whose new plant is to be located at Allentown, Pa., near their present wire works, have awarded the contract for the entire machinery, embracing three roll trains, roll lathes, shears, shafting and pulleys and numerous other parts to the Lewis Foundry and Machine Company, Limited, of Pittsburgh.

Lucy Furnace (charcoal), at Mount Union, Pa., has recently been thoroughly repaired and improved, and will be started up in a few weeks under the management of John Whitehead, the owner of the furnace.

The new buildings of the National Forge and Iron Works, East Chicago, Ind., are about completed, and the new machinery is now being put in place. The officers of the company expect to get the works in operation about the 1st of August.

The Ellis & Lessig Steel and Iron Company, of Pottstown, Pa., have announced the closing of their nail works at the end of the present month, due to the demoralized state of the market. The company have over 100 machines and have always been free from labor troubles.

The Brooke Iron Company, of Birdsboro, Pa., after a run of two weeks, following an idleness of nearly two months, were compelled to again suspend operations recently owing to the giving out of nail-plates, caused by the plate-mill hands being on a strike.

A number of well-known iron capitalists are expected to lay before the Association of Business Men of Ashland, Wis., a project to establish a rolling-mill plant at that place. It was estimated some time ago that for a plant worth \$1,000,000 the city of Ashland would be expected to devote a site worth not less than \$25,000 and \$100,000 in city bonds running 20 years with interest.

After a continuous run of 14 months, the National Furnace, at De Pere, Wis., was blown out on the 18th inst. During the last two weeks of its run the furnace produced 989 tons of pig-iron.

The Keystone Rolling Mills and Seyfert's rolling-mill, both of Reading, Pa., have resumed operations, the former on Monday of last week, each mill giving employment to some 250 men. It will be remembered that the Keystone mills shut down at the time of the Reading Iron Works failure, but will hereafter run independently of the latter, seeking the open market to dispose of their product. On the other hand, the status of the blast-furnaces in the Reading district is very low, leading to the stoppage indefinitely of a number of ore mines at Farnington, Kline's Corner and all through the Macungie Flats, and the closing down of several quarries from which the furnaces drew their supply of limestone for smelting purposes.

From Sharon, Pa., come reports of a general reduction of 10 per cent. in the wages of furnace employees throughout the Shenango Valley, made necessary, the manufacturers claim, by low prices and general depression in the iron trade. The 1200 men affected have accepted the reduction, and the different works are running steadily.

### Machinery.

The Canton Mfg. Company, of Canton, Ohio, have just shipped one of their well-drilling machines to South America, and are finishing up another fine one for shipment to a Southern Ohio point. One of

these machines is being used by the water-works department of the city in drilling the wells at the water-works station for a supply of water. Another special article of manufacture by this company is Poorman's patent Columbia steam-heating or hot-water boiler. Among the patents granted recently was one to E. W. Poorman for a rock and earth drilling-machine, which will also be manufactured by this company.

The works of the Niles Tool Company, at Hamilton, Ohio, are being operated 23 hours per day with all the workmen that can be conveniently employed.

The capital stock of the Standard Under-ground Cable Company, at Pittsburgh, has been reduced from \$3,000,000 to \$1,000,000. The company have recently received large orders for electric-light wires from Portland, Ore., and from Washington, D. C.

Theo. Smith & Bro., of Jersey City, have closed a contract with the Central Stock-Yard and Transit Company to build the engines, boilers, hauling-tracks, &c., for the Meadows Abattoir, which was recently destroyed by fire.

The Chicago representatives of the New York Belting and Packing Company, W. D. Allen & Co., have just issued a new and attractive catalogue, containing description of a full line of vulcanized rubber goods, including belting, packing and hose. The cover is a buff tint, is very attractive, and is printed in red and bronze. A view of the company's extensive warehouse and sales-rooms, 151 Lake street, is shown on the back. It is a pamphlet of 40 pages, profusely illustrated, typographically correct in every particular, and great care and much labor have evidently been bestowed in its preparation and production. Its possession cannot fail to be of benefit to those interested in the line of goods which Messrs. Allen & Co. handle. They also represent the Hoyt leather belting at Chicago.

The Marietta (Pa.) Foundry has been succeeded by the Marietta Casting Company, a new charter having been granted. Additional buildings are being erected and equipped with the most improved machinery for the manufacture of castings, hollow-ware and enameling, and a two-story building, 178 x 40 feet, will be used as the finishing department. The foundry is in full operation, turning out light and medium castings. The officers of the company are: President, B. F. Hiestand; treasurer, J. L. Brandt; secretary and manager, Geo. F. Stibgen.

The Magnolia Anti-Friction Metal Company, of 74 Cortlandt street, New York, have published a circular containing a great deal of information relative to tests made of their metal in competition with similar metals manufactured by other establishments. All of the certificates in this circular are exceedingly complimentary to the merits of the Magnolia metal, while some of the tests show remarkable results in favor of the product of this company. A very interesting certificate is that of the Chicago Tire and Spring Company, who state that they have used the Magnolia metal in the journals of their mill for rolling locomotive tires where there is a pressure of 5000 pounds to the square inch, and that it has given better satisfaction than anything used heretofore.

James W. Queen & Co., of 924 Chestnut street, Philadelphia, have issued a circular containing important information for scientists who are about to visit the Paris Exposition and the International Congress of Electricians. They call their attention to the fact that the firm have representatives in Paris who have had many years'

experience in the selection and purchase of scientific apparatus of every description. They will furnish letters of introduction to their agents in Paris, which will enable much valuable time to be saved in hunting up prominent makers of such apparatus and making bargains with them. Those not thoroughly conversant with the French language will find this arrangement especially advantageous. The details of shipping and passing through the United States Custom House will also be carefully arranged by the representatives of the firm.

The rapidly-increasing demand for large compound engines has necessitated the fitting up of a new machine shop by the Westinghouse Machine Company, of Pittsburgh, Pa. A large planer has been erected by William Sellers & Co., and a cylinder-boring machine of special design, made by the Pond Machine Tool Company, will be delivered in June.

The Grand Avenue Cable Company, of Kansas City, say that probably the hardest line in that city on cable ropes is their Walnut street line, which hauls both the Fifteenth street and Westport cars. On October 25 they put in a wire rope manufactured by the Broderick & Bascom Company, of St. Louis, which lasted 114 days, making a mileage of 16,441 miles. This showed a gain over the rope previously used, which was manufactured by another company, of 6377 miles, which is 89 per cent. longer, and assuming the cost of the cable to be \$4400, made a saving of \$1716.

The Wainwright Mfg. Company, recently organized under the laws of Massachusetts with a capital stock of \$100,000 paid in, succeed to the business of the late concern of the same name, of Medford, Mass. The officers of the new company are Jere Abbott, president; John A. Loring, vice-president; George D. Hall, Jr., treasurer and manager. They will continue the manufacture of feed-water heaters, filters, surface condensers and fittings, and also a general foundry and machine business, with offices at 34 Oliver street, Boston, and factory at Medford, Mass.

#### Hardware.

The Allentown Hardware Company have been chartered at Allentown, Pa.

The Hartman Mfg. Company, of Beaver Falls, Pa., have recently made a steel mat for the office of the Hotel Richelieu, Chicago, 41 feet long and 4 feet wide, the largest ever made in the world in one piece. A somewhat smaller one was recently made for the Palmer House, of that city.

It Governor Hill signs the Fassett Prison bill the hollow-ware shop at Auburn prison will be started at once, and arrangements will be made for the manufacture of brass fittings for plumbing.

On Wednesday, the 15th inst., the Columbia City Mfg. Company, of Columbia City, Ind., consolidated their interests with those of the Akron Hardware Company, at Akron, Ohio, and will at once remove their plant to the last-named place.

The building occupied by the Fish Mfg. Company, at Columbus, Ohio, devoted to the manufacture of buggy and carriage hardware, was burned on the 23d inst. The loss is estimated at \$25,000 upon building, machinery and finished work. The firm carried an insurance of \$11,500.

The Arms Bell Company, of Youngstown, Ohio, manufacturers of nuts and bolts, whose plant was destroyed by fire some weeks since, have decided not to rebuild, and will go out of business.

Joseph Ehart & Son, Fort Madison, Iowa, are putting on the market a line of

tin fruit cans, to seal with wax, for which they are expecting a good demand the coming season. They have increased their facilities for making the goods and put them on the market conveniently crated.

The Chelsea File Works, Norwich, Conn., manufacturers of the Chelsea hand-cut horse rasps, report business so brisk that they are compelled to run their works overtime to keep up with orders. This concern make hand-cut goods exclusively, for the quality of which they have an excellent reputation. The material used is made specially for them, and great pains are taken with the workmanship to insure uniform cutting properties and durability.

#### Miscellaneous.

The employees of Russell & Co., Massillon, Ohio, are agitating the organization of a local mutual insurance society. Formerly it was the invariable custom upon the death or disabling of a comrade to make up a subscription list. The men now realize that it would be a better method to provide a fund by small, regular assessments, and that plan will be at once adopted, as it is working well in numerous manufacturing establishments in various parts of the country.

The strike of the railroad coal miners, at Pittsburgh, which was commenced several weeks ago, has been settled. The men struck for a uniform yearly rate of 74 cents a ton, but a compromise has been effected by which the men are to receive 73 cents. Over 7000 men have gone back to work.

The new Asbestos steam-pipe and boiler covering recently put upon the market by the Chalmers-Spence Company, New York, is meeting with pronounced success wherever a thoroughly reliable, non-conducting, water and fire proof material is needed for covering purposes. For electric-lighting stations it is looked upon with especial favor. The Chalmers-Spence Company have just completed a contract for covering pipes at the new stations of the Edison Electric Illuminating Company, of this city, one of which is located at Twenty-sixth street and the other at Thirty-ninth street. The materials used were their patent fire-felt covering for steam-pipes, and the same material as supplied in sheet form, for drums, heaters, &c.

#### The Carpenter Steel Company, of Reading.

From the Reading (Pa.) Times of the 21st inst. we take the following:

The old P. & R. rolling-mill on North Ninth street, which has been idle for seven or eight years, will be started in a few weeks as a steel plant. For some time past it has been known that negotiations were pending between the railroad company and J. H. Carpenter, of New York, to start the mill, and the consummation of the bargain will be good news for the unemployed iron-workers of the city, as well as the entire business community. A force of men will be put to work this morning and the necessary repairs, improvements and alterations which are required will be pushed forward to an early completion. This will be a work of about six weeks. All the old machinery except the engines will be torn out and the furnaces will be rebuilt. The new machinery for the manufacture of cutlery and tool steel has already been purchased and will be put in as soon as the old can be removed. The business will be conducted under the name of the Carpenter Steel Company, and not the Superior Steel Company, as has been heretofore announced, and the processes to be used are those invented by Mr. Carpenter. A gratifying

feature of the new industry is that large orders have already been booked from prominent parties and that local labor will be employed in the new industry, with the exception of a few experts who will be brought from New York. It is the intention of Mr. Carpenter to add to the mill a complete nail and tool works, which products will be manufactured from the steel which the mill will produce. When the combination of plants is completed the number of men employed will be sufficient to give a decided boom to the northern portion of the city. Mr. Carpenter is an engineer of high standing and has been employed in some of the most important engineering enterprises in the country. He is a graduate of the Annapolis Naval Academy and was the youngest naval officer in the service of the country, having entered the service when he was but 15 years of age. He was also an engineer with the Roeblings, who built the East River bridge.

#### Spur Gears.

The Brown & Sharpe Mfg. Company, of Providence, R. I., have issued the following valuable data on spur gears:

Having the number of teeth and the diametral pitch, to obtain the pitch diameter divide the number of teeth by the diametral pitch.

If the number of teeth is 40, and the diametral pitch is 4, divide 40 by 4, and the quotient, 10, is the pitch diameter.

Having the number of teeth, and the diametral pitch, to obtain the whole diameter or size of blank add 2 to the number of teeth, and divide by the diametral pitch.

If the number of teeth is 40, and the diametral pitch is 4, add 2 to the 40, making 42, and divide by 4; the quotient, 10½, is the whole diameter of the gear or blank.

Having the number of teeth and the diameter of the blank, to obtain the diametral pitch add 2 to the number of teeth and divide by the diameter of the blank.

If the number of teeth is 40, and the diameter of the blank is 10½ inches, add 2 to the number of teeth, making 42, and divide by 10½; the quotient, 4, is the diametral pitch.

Having the pitch diameter and the diametral pitch, to obtain the number of teeth multiply the pitch diameter by the diametral pitch.

If the diameter of the pitch circle is 10 inches, and the diametral pitch is 4, multiply 10 by 4 and the product, 40, will be the number of teeth in the gear.

Having the whole diameter of the blank and the diametral pitch, to obtain the number of teeth in the gear multiply the diameter by the diametral pitch and subtract 2.

If the whole diameter is 10½ and the diametral pitch is 4, multiply 10½ by 4 and the product, 42, less 2, or 40, is the number of teeth.

To obtain the distance between the centers of two gears, add the number of teeth together and divide half the sum by the diametral pitch.

If two gears have 50 and 30 teeth, respectively, and are 5 pitch, add 50 and 30, making 80, divide by 2, and then divide this quotient, 40, by the diametral pitch, 5, and the result, 8 inches, is the center distance.

William Kerr, treasurer of the Crane Mfg. Company, Chicago, died at his residence, No. 65 Laflin street, on the 23d inst. His death is attributed to exhaustion from overwork. He had been recreating at Colorado Springs for some time past, and returned home only a few days prior to his death. He was associated with the company for a long time, and had many intimate acquaintances throughout the West.

# The Iron Age

New York, Thursday, May 30, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## The Late Meeting of the Iron and Steel Institute.

Two subjects were brought up at the meeting of the Iron and Steel Institute, full accounts of which have just reached us, that deserve to be brought to the attention of those interested in the trade on this side of the Atlantic. The first was the publication of sufficient evidence to show that alloys of steel and nickel possess properties which are very likely to make them valuable to the constructor and the engineer. James Riley, of the Steel Company of Scotland, Glasgow, the well-known metallurgist, submitted a paper on this "nickel-steel," the manufacture of which is the invention of a Frenchman, M. Marbeau. During the discussion of the paper, however, the fact was developed that J. F. Hall, of Sheffield, has been working independently on the same lines for a considerable period, reaching results equally extraordinary. Mr. James Riley reports that no difficulty was experienced in making, in the open-hearth, in as short a time as is required for the ordinary scrap charge, nickel-steel containing up to 50 per cent. of nickel. Nor are any special appliances necessary. The mechanical properties are certainly very extraordinary. The following tests will convey an idea of the quality of the metal:

Number.	Analysis.			Mechanical tests.		
	Nickel Per cent.	Carbon. Per cent.	Manganese. Per cent.	Elastic limit. Gross tons.	Tensile strength. Gross tons.	Elongation in 8 inches. Per cent.
3....	3.0	0.35	0.57	28.0	48.5	20.3
4....	3.0	0.60	0.26	30.3	42.9	7.5
6....	4.7	0.22	0.23	28.0	40.8	20.0
7....	5.0	0.30	0.30	28.0	42.8	15.0
8....	5.0	0.50	0.34	32.5	46.8	13.5
10....	25.0	0.27	0.85	12.7	45.8	29.0
11....	25.0	0.82	0.52	15.1	42.1	40.0
12....	49.4	0.35	0.57	21.0	37.0	20.0

The tests chosen from those submitted were all from specimens as rolled and annealed, the original document giving additional details. Mr. Riley dwells with particular emphasis upon the qualities of the alloys under 5 per cent., pointing out what economies might be realized in large structures by having a material possessing a tensile strength of 40 tons coupled with an elastic limit of 28 tons. In the discussion J. F. Hall gave some interesting tests with nickel-steel for gun-bombs, conducted by Holland & Holland, of London. Both of the experimenters brought up testimony to prove that the new alloy possesses greater resistance against corrosion. No data were submitted bearing on the cost of the new steel, but it is not difficult to reach the conclusion that on that point the future

will allow of serious reductions, so far, at least, as the nickel is concerned. It is pretty generally known that the narrowness of the market for the metal has been the only obstacle to a very heavy increase in the production of nickel. Very large quantities could be readily supplied by the Canadian Copper Company, for instance. With a heavy demand insured larger quantities could be supplied at a marked lowering in the price without lessening the profits of the producer.

The second important paper read was that of J. H. Darby, of the Brymbo Steel Works, on the manufacture of basic open-hearth steel. After years of experimenting success attended the efforts to produce steel by the "pig and ore" process, the work in other countries and by other establishments having been directed almost exclusively to making basic steel by the "pig and scrap" method. Here, too, as in the Bessemer process, the pig must approach a certain chemical composition, the specification to which the Brymbo works ran being 3 per cent. of phosphorus, 0.04 sulphur, 0.40 silicon and 1.75 manganese. It was found that any kind of ore, provided it is low in silicon, may be used, the phosphorus contents being of no importance. Mr. Darby states that the quantity of ferro which must be added is less in the basic open-hearth than in the basic Bessemer, 10 to 12 pounds of 80 per cent. ferromanganese being enough to produce the same result as 30 pounds per ton of steel in the basic Bessemer vessel. This, he claims, indicates a striking difference in the purified metal from both processes. Mr. Darby states that after an experience in making 60,000 tons of basic open-hearth steel he has not observed any red-shortness in the usual soft quality produced. So far as the life of the bottom is concerned, he cites the case of one furnace still running which has cast 3660 tons of dead-soft steel without relining. It is evident that the basic open-hearth is making rapid progress, justifying the favor with which it is regarded in this country.

It is intimated by those who are conversant with the progress of affairs in the Vermillion range of the Lake Superior iron-ore district that there is danger of a mining-stock craze in that section similar to the disastrous Gogebic speculation which prevailed some two years since. The vast extent of the Vermillion ore field and the remarkable richness and purity of the ore have attracted the attention of professional boomers and restless speculators, and already more iron mining companies are said to have been organized to operate in it than in any other iron district in the country. These companies have been chartered in many States, so that it is very difficult to ascertain their full number; but enough has come to light in this regard to warrant the assertion above made. Of course a number of these companies will become actual producers, but others will be used only for the purpose of conducting a speculation in mining stocks. It will be well for those who are tempted to invest in Minnesota iron-ore companies to investigate thoroughly the schemes presented to them, and not to purchase mining stock too hastily. With the Gogebic collapse so fresh in our recollection, it seems almost idle to utter words of warn-

ing when a similar movement in a neighboring district comes forward. But there appears to be good reason for it, and those who are willing to receive advice will take heed.

## A New Experiment in Profit-Sharing.

Much interest has been aroused in New England labor circles by the announcement that the Bourne Cotton Mill, at Tiverton, R. I., which is in the Fall River district, will hereafter share its profits with its employees. Not less than 6 per cent. of the amount of cash dividends declared and paid to the stockholders of the corporation is to be divided among the operatives in proportion to the wages they will earn in a semi-annual period. The capital of this mill is \$400,000. In 1885 it declared a dividend of 2 per cent.; in 1886, 6 per cent.; in 1887, 14 per cent.; and in 1888, 16 per cent. On the basis of the earnings in the last year, therefore, \$1920 would be divided among the employees as their share for six months. While the amount received *per capita* would be small, the principle which is embodied is hailed by those interested in the welfare of the wage-earners as a most important one. If it were universally adopted by the Fall River mills, it is believed that much of the antagonism now existing between labor and capital in that important manufacturing center would be removed.

The division of profits with employees has long been held by students of the labor problem as the correct solution of labor troubles in manufacturing establishments. Wherever it has been tried, this method of cultivating the good-will of the toilers has been attended with satisfactory results. Workmen thus become directly interested in the operations of the establishment in which they are employed and may naturally be expected to perform their several functions more conscientiously. They may be expected to guard the interests of the concern, turning out a larger or a better product according to circumstances, exercising prudent economy in the use of material furnished them and jealously observing shortcomings on the part of their fellow-workmen.

Co-operation, in the broad sense of the term, has been demonstrated in numerous instances to be impracticable, but as carried out in this guarded way it is attended with advantages which are appreciated by all the interests concerned. The employees do not participate in the management of an establishment which they have not helped to create, neither do they risk their savings in its maintenance; but they know at each dividend period whether the business of the term covered has been fairly profitable or discouragingly unremunerative. They may be inclined to ask for a heavier percentage of the profits if the term has been extraordinarily prosperous, but they will hardly force an issue on this point when they know that they will not be called on to bear a share of the losses incurred in a period of depression and very low prices.

The growth of public sentiment in this direction has been slow but none the less sure. The circle widens every year, including more and more enterprises of prominence in their respective localities. The very slowness of its growth is a good indication. If it were rapidly spreading



it might be regarded as merely spasmodic and ephemeral. But it seems destined to secure more and more converts who will thoroughly believe in it as a remedy for labor troubles and who will adopt it as a permanent institution in carrying on their enterprises. It may not result in the millennium, and labor disputes may still be expected to occur even where profit-sharing is in force; but abuses will have to be grave indeed to make employees thus favored abandon their posts and go out on a strike.

#### Mr. Hewitt and the American Iron Trade.

While the economic views of the Hon. Abram S. Hewitt have the approval of but a comparatively small number of his colleagues in the American iron trade, he is, nevertheless, held in universal esteem, and whatever he says receives thoughtful consideration. He is known as a man of earnest convictions, and his long experience in the manufacture of iron, as well as his prominence in national affairs, invest his expressions of opinion with more than the usual importance attached to the utterances of the sages of the trade. He is now in Europe, and has been interviewed there with regard to the future of the American iron and steel industry, and also upon the special business which has called him abroad at this time.

Upon the first point he declares that the tariff prevents the United States from becoming the great iron and steel producing country of the world; that if the "preposterous tax" of protection was taken from iron we should, in a short time, not only supply ourselves with this metal, but would supply a great part of the world besides. He asserts that the effect of the change would be the closing up of a number of iron mines and iron and steel plants located in certain parts of the country, but he maintains that these individual losses would be much more than made good by the establishment of new industries throughout the center of our country, from Michigan and Wisconsin on the north to Tennessee and Alabama on the south. It will naturally occur to our readers, who are in full possession of facts not necessary to recount here, that this very movement is going on at present, irrespective of the tariff. If the development of new iron districts in the South and West continues for but a few years longer at the present rate of progress, and the cost of producing iron and steel steadily cheapens, as there is reason to believe it will, the exporting point may be reached without any change in the economic policy of the country. To most people it looks as though the United States is destined to become "the great iron and steel producing country of the world," and nothing can stop it. If the tariff is really a bar to our progress in that direction it seems to be one that is very easily surmounted.

The second point in Mr. Hewitt's interview is that he has gone abroad to look into matters connected with the manufacture of steel, more particularly into the basic process of making open-hearth steel. He says: "My visit will probably result in time in a general adoption in America of the basic process. It is well adapted to the Southern States. I have seen the prin-

cipal steel manufacturers of England and have gained all the information I hoped to get, and I am well satisfied. I am convinced that America will make iron and steel for mankind in the long future. We have the iron, coal, capital, skill and energy necessary to do it." The Southern newspapers are particularly well pleased with this statement. They are highly gratified that a Northern iron manufacturer of such eminence as Mr. Hewitt should thus express himself, and they are doubtless impatient for his return home to secure for their section the practical results of the investigations to which he alludes.

Whether Mr. Hewitt's researches into the method of manufacturing basic steel may lead to important consequences for this country or not, it is reasonably certain that more decided efforts than have yet been made will soon be inaugurated in that direction in one or more localities. The new Illinois Steel Company have in contemplation the erection of a basic Bessemer plant at Milwaukee. Should such a company embark in this new industry there is little doubt that it would be made a success, in which event other works of the same character would be speedily undertaken in sections possessing the requisite ores for the process. Mr. Hewitt is therefore in line with progressive members of the iron trade who believe that the time has come for decided action with regard to the manufacture of basic steel on this side of the Atlantic. If he renders important assistance to this movement, and the manufacture of basic steel becomes an important feature of our domestic industry largely through his instrumentality, he will have performed a service to his fellow-citizens which will add greatly to the honorable distinction he now enjoys.

#### Our Trade with Japan.

Trade between the United States and Japan is considerable. While our domestic export thither is steady and capable of expansion, our import fluctuates according to the position of tea in our markets, this country being the only foreign consumers of Japanese tea. Japanese silk we take in increasing amounts. What the possibilities of enterprise and trade in that direction are may to some extent be gathered from passages we extract from J. J. Rein's recent work on Japan.

Japan is neither a large country nor a rich one. It offers no encouragement to the builders of great railroad lines, for the surface is mostly mountainous, the people travel very little, and they do not have much freight to move. The entire area of the country is not as great as that of the State of California, and only about 10 per cent. of the soil is under cultivation, the remainder being forest, desert and mountain. Nor is it a land abounding in precious metals, as some published reports have led Americans to believe. Many years ago much gold was found there, but by persistent efforts, continued through centuries, the leads were worked out, and careful "prospecting" has failed to discover new ones. There are no great accumulations of wealth waiting to be put into "public works" or other bonanzas, such as enterprising Americans and Europeans have inflicted upon communities unaccustomed to Western ways. The people live comfortably, but they are poor; they work persistently but live simply; otherwise they could not live at all. The principal exports to European and American ports are raw silk and tea. These two articles constitute almost the

entire export trade, except to China and Asiatic islands, for Japanese ceramics, though often esteemed as curiosities, make a very small showing on export lists. Yet, as has already been said, the people are industrious. The reason they have so little to sell—and to buy with—is that home demand consumes almost all they can produce. Nearly 40,000,000 people must subsist on the products of less ground than is under cultivation in the single State of New York. With all their agricultural industry the Japanese do not always succeed in raising enough rice for home consumption. With the reclamation of more soil and more attention to forest products the country's resources may be increased, but these facts offer no inducement to Americans to organize drainage companies for Japan or go into the business of destroying forests on our own unrivaled plan.

Japan covers an area of 382,418 square km., and, according to the census of Jan. 1, 1887, the population was 38,507,177, including 6807 foreigners, 4071 being Chinese, 1200 Englishmen, 621 Americans, 318 Germans, 220 Frenchmen and 377 belonging to other nationalities. There are 28 cities of over 30,000 inhabitants, the largest being Tokio, with 1,552,457; Osaka, with 353,970, and Kioto, with 255,408. The public indebtedness (including \$67,263,274 paper money in circulation, \$20,000,000 cost of the Nakasendo railroad and \$7,522,032 foreign debt) was \$249,108,578 on July 1, 1887. The budget for 1888 showed an expenditure of \$79,935,553, squared by an income of \$79,936,870. The Japanese silver dollar is worth 80 cents American gold. The strength of the army is 45,954 rank and file; the navy is composed of 36 men-of-war of a total tonnage of 50,090, with 50,979 horse-power and mounting 221 guns. Japanese foreign trade has during the past five years been steadily on the increase, as is shown in the following table:

	Import.	Export.	Excess of export.
1888.....	\$65,456,234	\$65,705,570	\$250,336
1887.....	51,699,769	52,408,228	708,454
1886.....	37,346,743	48,870,371	11,523,628
1885.....	29,346,379	36,152,008	6,805,624
1884.....	23,777,895	32,129,499	4,351,554

Reduced to thousands of dollars, the export in 1887 consisted of raw silk, 19,280; tea, 7349; coal, 2387; rice, 2255; copper, 2031, and porcelain, 1811; the chief articles of import were cotton goods and woollens, cloth, sugar and petroleum. In the latter Russia begins to compete with ours. The trade with this country has been as follows in the past two years:

Calendar year.	Import into the United States.	Domestic export to Japan.
1888.....	\$17,623,573	\$4,081,218
1887.....	17,742,238	4,150,777

The number of sea-going vessels arrived in 1886 was 1067, with a joint tonnage of 1,162,988; 88 being under the American flag, jointly registering 151,150 tons. The railroads of the empire made the following showing on January 1, 1888, in kilometers:

	In running order.	Building.	Projected.
Government lines.....	500	332	130
Private lines.....	485	64	1,995
Totals.....	985	396	2,115

The nature of the country puts unusual difficulties in the way of construction. One line of 205 miles in length involves the construction of 14 tunnels, 18,000 feet long, and the bridging of 11 rivers. One of these has a velocity in time of flood of 27 feet per second, and in another the brick piers have to be sunk to a depth of 80 feet. A range of mountains is crossed at a height of 1468 feet. Part of the line ascends a height of 8144 feet, and during

five months of the year work is rendered impossible by the snow, and sometimes in the summer months by an epidemic of cholera.

The length of telegraph lines is 9810 km.; of wire, 24,790; there were forwarded in the interior in 1886 1,790,282 telegrams and cable messages to the number of 39,028. The internal postal service forwarded simultaneously 115,068,846 items of mail-matter and the foreign 1,036,902. The Japanese are enterprising, but they now proceed more cautiously after the severe lessons experience has taught them in financial matters during the last decade. Commercial relations with them are, therefore, safer at present, and Japan is generally looked upon as a desirable country to trade with.

The temporary character of advantages secured by manufacturing establishments in the reduction of freight rates on raw materials is well illustrated by recent occurrences at Pittsburgh. The rate on Lake Superior ore from Cleveland was reduced after a long and hard fight between the consumers of ore and the railroad authorities. The reduction was small, but it was regarded as very important by those who used large quantities of ore, and they were very well pleased at the prospect of even this saving in the cost of manufacturing iron. But they had a very short season of rejoicing, for immediately their trade rivals in other iron-producing sections insisted on a corresponding reduction in coke rates to enable them to compete with the Pittsburgh manufacturers. They will probably get it, the balance will be restored to its former equilibrium, and neither set of manufacturers will have any advantage over the other.

There is a probability that the rush to Oklahoma will be repeated to some extent about August 1, when 3,500,000 acres of the finest land in Dakota, known as the Sisseton and Military reservations, are opened for settlement in tracts of 160 acres. The Military Reservation is a rectangular tract located in Marshall County. The great Sisseton Indian Reservation is a tract in the shape of a wedge, the point of which rests on Lake Kampeska. The western boundary runs through the counties of Codington, Grant, Day, Marshall and Sargent to the forty-sixth parallel. The northern boundary lies in Sargent, Richland and Robert counties. Lake Traverse, on the Minnesota border, is the eastern boundary for a distance of 30 miles, the boundary line running thence through Roberts, Grant and Codington counties to Lake Kampeska again. The land is watered by numerous lakes and small streams and is sufficiently hilly to be well drained. The soil is a black loam. It is the most fertile on the eastern border of the Territory, where large crops of wheat are raised. Stock fares well also, as there is excellent grazing both summer and winter. Oak and cottonwood trees abound on both reservations. Building stone is plentiful along the central ridges. The rainfall is usually plentiful, the average for several years being 17.27 inches.

Wm. M. Home & Co., 74 India street, Boston, have been appointed sales agents for the New England States for Warr's patented straightened shafting and bar-iron of all kinds, manufactured by James C. Warr, at Wareham, Mass., and will carry a stock at their warehouse in Boston.

### The Engineers' European Excursion.

An important event in engineering circles is the visit to Europe this year of a very large representation of the engineering societies of the United States. The purposes of their visit have already been set forth in these columns. The first installment of excursionists left New York on the 25th inst., on the City of Richmond, one of the steamers of the Inman Line, destined for Liverpool. This steamer had been chartered on the joint account of the American Society of Mechanical Engineers and the American Institute of Mining Engineers. The list of passengers furnished by the agents of the steamship line embraces many familiar names and is as follows:

W. H. Adams,  
Robert Allison,  
Geo. I. Alden,  
Thos. W. Bakewell,  
D. L. Barnes,  
Geo. H. Barrus,  
Jerome L. Boyer,  
Morgan Brooks,  
W. F. Barnes,  
Chas. S. Beach,  
Giles Beach,  
W. H. Baldwin,  
Stephen W. Baldwin,  
Matt. A. Beck,  
C. M. Collins,  
Ralph E. Curtis,  
W. D. Cadwell,  
Barton Cruikshank,  
Jas. Christie,  
Fredk A. Canfield,  
Wm. H. Dodge,  
F. H. Daniels,  
Fredk P. Dewey,  
Victor E. Edwards,  
W. V. Fairbairn,  
Wm. Forsyth,  
Robt. Fraser,  
John R. Freeman,  
A. C. Fowler,  
H. Manning Fish,  
Edward O. Goss,  
Geo. A. Gray,  
Stanley D. Gifford,  
E. L. Gould,  
Geo. H. Hewitt (N. Y.),  
W. O. Hildreth,  
W. Hill,  
H. D. Hibbard,  
Edwin T. Howard,  
Wm. M. Habbishton,  
Sumner Hollingsworth,  
John T. Hawkins,  
Edward J. Hall,  
Edward J. Hall, Jr.,  
Chas. E. Hyde,  
Alfred E. Hunt,  
O. S. Harmon,  
O. J. Harmon,  
Geo. H. Hewitt (Col.),  
Jno. C. Humphrey,  
E. V. D'Inviillers,  
D. S. Jacobus,  
H. D. Johnson,  
E. P. Jennings,  
Frank E. Kirby,  
Chas. Kirchhoff, Jr.,  
William Kent,  
G. Lavagnino,  
Thos. H. McCollin,  
Edw. McIlvain,  
Howard McIlvain,  
Edwin Mickleby,

A. S. Mahoney,  
E. H. Mumford,  
W. T. Magruder,  
John H. Milholland,  
Allyne H. Merrill,  
Edward F. Miller,  
H. M. Montgomery,  
Aug. W. Newell,  
Edw. Nichols,  
John D. Ormrod,  
John C. O'Connell,  
Bernard O'Connell,  
Walter Phillips,  
C. D. Parker,  
Geo. P. Putnam,  
Andrew J. Provost,  
H. Roberts,  
Edgar Richards,  
Theo. W. Robinson,  
Walter S. Russell,  
D. W. Robb,  
Francis H. Richards,  
C. S. Ridgway,  
Henry I. Snell,  
Oberlin Smith,  
Archy A. Stevenson,  
Jesse M. Smith,  
F. F. Sharpless,  
Ambrose Swasey,  
Chas. Sperry,  
T. Jackson Shaw,  
Joseph Shaw,  
Geo. R. Stetson,  
H. H. Suplee,  
Peter Schwamb,  
Newell Sanders,  
W. P. Todd,  
J. Archie Taylor,  
Jas. A. Tilden,  
Leonard Thompson,  
Edward B. Thompson,  
Henry R. Towne,  
William N. Taintor,  
Starr Taintor,  
F. H. Underwood,  
E. A. Uehling,  
W. M. Whitney,  
Baxter D. Whitney,  
Maunsel White,  
Chas. Wilbraham,  
Wm. C. Williamson,  
J. D. Williamson,  
Jones Wister,  
Horace Wyman,  
H. Winfield Wyman,  
Geo. W. Weeks,  
Joseph J. White,  
Wm. Webster,  
C. J. H. Woodbury,  
V. F. Worcester,  
Walter Wood,  
John P. Zane.

The steamship City of New York, of the same line, which sailed for Europe on Wednesday, took out a large number of representatives of the American Society of Civil Engineers, together with some mechanical and mining engineers, bound on the same errand. We have obtained from Chas. E. Emery, of the committee, the following list of gentlemen who form this section of the excursion:

D. J. Whittemore,  
William Fox, M. D.,  
T. K. Thomson,  
Prof. R. Fletcher,  
Prof. C. L. Crandall,  
J. D. Hawks,  
C. E. Fogg,  
Max E. Schmidt,  
Sr. F. DeGaray,  
Chas. E. Emery,  
Jas. Archibald,  
John J. Hopper,  
D. E. McComb,  
Wm. H. Searles,  
A. B. Hill,  
Prof. J. V. Hazen,

Prof. Wm. Watson,  
Washington Jones,  
W. L. Ferguson,  
John Thomson,  
S. B. Downes,  
C. C. Martin,  
Robt. Cartwright,  
Chas. J. Morse,  
Fred. Brooks,  
Wm. F. Booth,  
Prof. L. L. Tribus,  
Wm. Starling,  
W. A. Brackenridge,  
N. M. Edwards,  
John T. Fanning,  
T. D. Lovett,

Julius Baier,  
Jas. B. French,  
E. A. Doane,  
Arthur S. Mahony,  
Arthur Pou,  
Arthur Hider,  
A. Dempster,  
Prof. Lewis M. Haupt,  
Wm. Gibson, Jr.,  
Thos. C. Clarke,  
John J. Hawks,  
W. H. Wiley,  
Prof. W. W. Johnson,  
Wm. White,

Chester B. Allere,  
Clark Fisher,  
Frank G. Darlington,  
Herbert G. Torrey,  
H. G. Reist,  
Chas. E. Wait,  
Chas. J. Hilliard,  
John F. Wilcox,  
Fred. A. Schaffer,  
Geo. M. Bond,  
Wm. Roberts,  
Geo. W. Miller,  
Geo. A. Barnard.

Many of the excursionists named in both the above lists were accompanied by their wives or other lady members of their families.

### Reading Iron Works Appraisement.

#### THE APPRAISEMENT FILED IN COURT.

The long-anticipated appraisement of the Reading Iron Works, which failed nearly three months ago, was filed at Reading on the 24th inst. The appraisers, W. C. Case, George E. Clymer and John Ruck, have been at work on it for over six weeks. They have appraised the personal property at \$568,567.93 and the real estate at \$715,042.50, a total of \$1,283,610.43. The personal property includes all the material on hand and finished goods. There is a mortgage of \$600,000 on the works, and after the payment of this, according to the appraisers' figures, there will be left \$681,610.43 for the creditors. The estimate claims of all the creditors is over \$1,500,000, which would give them from 38 to 40 per cent. The personal property account of the firm is very heavy. The personalty in the tube works, Reading, is appraised at \$219,353; in the steam forge, \$3326; sheet mill, \$35,686; blast-furnace, \$96,732; foundry, \$42,554; Gibraltar Iron Works, \$28,042; Camden Tool and Tube Works, \$1850; Philadelphia warehouse stock, \$51,212; Philadelphia warehouse book account, \$18,825; general ledger accounts, \$42,263. Among the heaviest figures in the real-estate appraisement are rolling mills and nail factory, \$60,858; tube works, \$148,532; steam forge, with machinery, \$40,600; sheet mill, \$57,500; two blast-furnaces, \$127,800; Scott foundry, \$126,700; one-half interest in Gibraltar Iron Works, with 715 acres of land, \$12,962; Camden Tool and Tube Works, \$5090; lots in the Twenty-eighth Ward, Philadelphia, \$60,000; lots in Chester and South Chester, \$18,000, besides numerous lots and houses in Reading, Philadelphia, Lancaster, Delaware and Berks counties. The appraisement of the real estate is far below what the erection of the plant cost. The cost of erection was probably \$1,800,000, but the appraisers' figures are what it would bring at a sale under the present state of the iron market.

Now, since the appraisement has been completed, it is believed that the affairs will be wound up with all possible speed. All the material that will not sell to advantage will be worked up into saleable goods, but staple merchandise, like pig-iron and the like, will be sold as rapidly as possible. An effort will be likewise made to dispose of the plant, because the longer it remains the more it will depreciate in value. There seems to be no prospect of reorganizing the concern. There are a number of parties ready to buy the works as a whole or piecemeal, and when they pass into the hands of the new owners they will be speedily put in operation. The pipe business, which was one of the principal branches of production engaged in by the company, has stiffened up since the suspension. It appears that the Reading Iron Works, in their anxiety for ready money, had for a long time been selling for whatever they could get. This demoralized the trade and made it un-

profitable everywhere. Since the suspension, however, the trade has become healthy and all the tube works in the country are being run at a fair profit.

### New Process of Softening Steel.

A new process of softening tool steel has recently been brought forward, and has attracted much attention because of the remarkable softness produced. By this process any of the ordinary steels, of the usual lengths and shapes, for making machine tools, punches and dies will, when treated, become so soft as to effect a most material saving in the cost of making the desired tool. After having been softened and cut to the required form, the steel is handled in precisely the same way as any of the well-known brands, such as Jessup or Black Diamond. It is claimed that the process, which is kept secret, affects in no way the chemical composition of the metal, but so alters its physical structure as to impart the qualities mentioned. A piece of Jessup steel which had been softened by this method was taken to the Stiles & Parker Press Company, who made a punch to cut a five-pointed star  $\frac{1}{2}$  inch in diameter and unusually sharp at the points. According to the instructions given, the punch was to be made and then tested by the Stiles & Parker people. In the making of this punch they saved about 20 per cent. in the cost, owing solely to the softness of the metal. After having cut it, they tempered it in the usual way in water. The punch was then forced through German silver  $\frac{3}{4}$  inch thick and through wrought iron  $\frac{1}{4}$  inch thick, and as a final test was forced through metal which cut only a part of the star, thus giving an unbalanced pressure tending to bend the punch. It was given a series of tests, not only unusual but which would not be tried except under like conditions where the manufacturer is instructed to give the tool the severest trial possible, and where, as is natural, he passes from one test to another more severe. The tool came out at the last as perfect as when it left the makers' hands.

According to this it seems evident that the process while softening the steel at the same time so changes it that when tempered it possesses greater strength than the same quality of metal untreated. The process is particularly applicable to die-sinking, where the hub, being of softened steel, can be made in much less time, while the die, also being softened, can be sunk cold instead of hot, as is now the common practice, thus saving time and labor. The die is then tempered and hardened in the usual way. It is claimed that this process changes what we might name the final quality of the metal so that its strength in high grades is increased at least 25 per cent. In handling the steel during the making of any tool it is absolutely necessary to perform all the operations cold, as the heating of the metal destroys the qualities imparted to it in the softening process. After having been treated the steel can be forged cold, can be twisted or bent in a way it would not stand before treatment, and can finally be tempered as desired. Any of the well-known brands of tool steel can be subjected to this process, and can afterward be treated in the usual way. The steel is treated by D. Cameron-Dalzell, of 7 Richmond street, Brooklyn, N. Y., the product being known as Dalzell's annealed improved cast-steel.

The new iron-ore bed at Mineville, Essex County, N. Y., operated by Messrs. Witherbees, Sherman & Co., has lately been producing from numerous openings iron ore of such remarkable purity as to be a wonder even to those familiar with

that unique deposit of Bessemer-iron ore. A sample taken so as to represent the average of a pile of about 400 tons was submitted to the company's chemist, T. R. Woodbridge, who found that it contained 72 per cent. of iron and 0.018 per cent. of phosphorus. Similar pockets of such ore have occasionally been found in the new bed, and from these pockets are often obtained unique crystals of magnetite, some of them 2 inches or more on the face. In the company's office at the mines is a perfect octahedral crystal,  $1\frac{1}{4}$  inches on the face, which can be readily lifted from its socket of granular ore.

### The Labor Troubles in Germany.

The workmen of Germany, who have long been remarkably tractable and apparently contented with their low wages, are rebelling against the conditions which have been so meekly borne. Westphalia has been the principal seat of an epidemic of strikes in the Empire, and the coal miners are taking the foremost part in the labor troubles. The object of their strike is to obtain an advance in wages of 15 per cent. and the establishment of a working day of eight hours.

With reference to this particular movement, *Kuhlows* says: "No indication has been seen that the miners in Rhénish-Westphalia are in a state of want similar to that in Belgium and certain French and English mining districts; their lot, of course, is but a moderate one, still they earn sufficient to live upon. It is not to be doubted, however, that they would endeavor to improve it should an opportunity for doing so arise. This is the first time that an organized strike has broken out in Germany which has not been confined to a single place. The movement has not arisen directly from among the workpeople themselves; according to all appearances it has been artificially produced through the machinations of agitators. It did not, however, require much trouble to organize the strike. The delegates of the Hibernia who put their demands before the chief president of the province, in answer to his invitation to resume work, observed that for the sake of honor they could not give in. It is clear that the strike is the work of the younger generation of workmen, the old miners being content with their lot. At the present moment the number of men idle is estimated at from 70,000 to 80,000."

"All things considered," says another authority, "the movement of the German miners is not at all surprising. They see on all sides evidences of great industrial activity, and hear of the prosperity of the coal and iron trades. They have endeavored to obtain advanced rates of remuneration and shorter hours of labor without avail, and as a last resort they have gone out on strike. That they should have taken this extreme step is a remarkable circumstance, seeing that the German artisans are not fond of strikes, besides which the laws of their country are not favorable to men who thus repudiate their contracts with their employers. Having struck, however, the behavior of the miners appears to have been somewhat riotous, and they have, in consequence, suffered severely at the hands of the soldiers, who have been called out to keep them in order. Many persons have been shot, indeed, and the whole of the Westphalian coal basin has been in a state of unrest. As a result of the cessation of adequate supplies of fuel many of the iron and steel works have been compelled to stop, although some of them lost no time as soon as the strike began in arranging for coal and coke from English or Belgian sources. It follows, therefore, that the German manufacturers and coal owners are just now passing through a period of

labor troubles which is more severe and more likely to affect their interests permanently than any previous dispute."

While these occurrences in Germany have a special interest for us only in connection with certain branches of the iron and steel trades, in which our manufacturers have felt the stress of German competition, the case is altogether different with British manufacturers, who have of recent years suffered from German competition in many lines. Referring to the German hold on international trade, the London *Ironmonger* says: "Aided by their undoubted perseverance, their considerable progress in certain branches of trade, and particularly by the long hours of labor and low wages of their workmen, they have made great progress. Now, however, Nemesis seems to have overtaken them. As they gained, so they seem likely to lose; but whether their present losses will be equal to their past gains is a knotty problem which has yet to be solved. That they must lose something so long as the strikes last is pretty certain; but the greater questions at issue will be determined largely by the broad outcome of struggle between the men and their employers. If the agitation brings about a general advance of the miners' wages and a reduction of the hours of labor, then it goes without saying that the cost of production in Germany must be enhanced, and to the extent of that advance the margin between their and our prices will be lessened. The German employers can scarcely expect that the agitation will be confined to the coal miners. On the contrary, it is only reasonable to assume that the iron-workers and other artisans will be so encouraged by the success of the miners that they will seek the like advantages for themselves. As a matter of fact, agitations for higher wages and reduced hours of labor are already reported from Berlin, Silesia and other parts of Germany, so that it may be taken for granted that the German manufacturers are on the eve of losing some of the advantages which they have so long enjoyed in respect of the cost of labor."

In view of the important consequences thus involved the outcome of the German labor trouble will be awaited with interest. The latest telegraphic dispatches from Berlin state that the situation at the Westphalia collieries continues critical and the proclamation of martial law is imminent. At some mines work had been resumed in the belief by the miners that the concessions demanded were to be granted, but the owners failed to give their assent and the strike was resumed. In the city of Berlin 19,000 men employed in the building trades have struck for higher wages and shorter hours of labor. The miners' strike seems only to be part of a general movement for increased wages and shorter hours of labor. Brewers, builders, carpenters, joiners, basket makers, furriers, tailors and other trades are affected. The tailors appear to have been the most successful. Many of the trades are coupling with their request for increased wages a demand for the reduction of the working day to ten hours. Others are denouncing Sunday work. In comparison with workmen in the United States, artisans of all classes in Germany are notoriously underpaid. Success in their endeavors to ameliorate their condition may temporarily disarrange some departments of industry, but it may have the effect, so far as this country is concerned, of equalizing differences which have made German competition severe.

A curious mixture of industries at one establishment is reported from Kansas. A \$100,000 mill, for the manufacture of sugar, salt and paper, is now being built at Arkalon, in that State. For three months it will make sugar from sorghum, then

work up the cane chips into paper, and the rest of the time turn out salt. To encourage sorghum sugar making the Kansas Legislature has exempted all sugar plants from taxation until 1895.

### Mexico's Material Progress.

The rapid accumulation by foreign capitalists of valuable Mexican properties, either in the form of ranching, agricultural or mining properties during the last two years, so remarks the *Boston Advertiser*, has been almost unprecedented. The modification of certain State or local laws as to alien land-holding and the more general and thorough understanding of these laws have contributed very largely to this result. Another cause of this outside investment, however, may be found in the great liberality and enterprise shown by the present Mexican Government in encouraging, so far as possible, every attempt made to develop the resources of the country, and to the undertaking by the Government itself, in part or wholly, of a number of measures calculated to aid in the national advancement. Although the sister republic has already had large railroad lines for some past years, the building of other and branch lines continues in a steady and satisfactory measure. Now that the opposition of the native race to the railway has been largely overcome by practical realization of the benefits accruing from such improvements, the work of further development has gone on steadily and uninterruptedly. Private as well as corporate capital has become largely interested in new schemes for transportation. The Government has continued its policy of financial or other aid to all projects of this nature, and both Mexico and Central America are being slowly embraced in a series of lines which promise, within the next ten years, to fully open up the country to the outside world.

Among the new companies, the Monterey and Gulf Railroad has recently railed 34½ miles, and constructed six miles more of roadbed, and is laying rails at the rate of ¼ mile a day. The Cordova and Tuxtepec has already completed part of its road, and is pushing on rapidly. The Tonala and Tuxtla Gutierrez has just commenced its road construction. Among the older roads the Inter-oceanic Company have nearly completed some sections of the road and intend to open them to travel within a short time. The Central Railway Company are working on the section from Aguas Calientes to San Luis Potosi. The Mexican Construction Company have their line from Manzanillo to Colima about ready for travel. In Yucatan the work of railroad construction is being pushed with great vigor. The total mileage of railroads in Mexico is estimated in President Diaz' message at nearly 5000 miles. In the matter of telegraph construction, the showing is still more favorable. The State construction of new lines for the last half year has amounted to an addition of about 900 miles, making the total length of the Federal system on April 1 over 13,000 miles, exclusive of double and triple wires and the lines temporarily transferred to the States.

At the annual meeting of the stockholders of the Quincy Copper Mine, on June 5, an increase in the capital stock will be asked for from 40,000 to 50,000 shares. The failure of the syndicate and consequent decline in copper have somewhat reduced the current earnings of the company, to which the building of a new railroad and stamp mill have been partly charged. Although the company have a surplus that could be made available, it is thought desirable to retain a surplus and increase the share capital.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., May 28, 1889.

The permission granted by the Secretary of the Treasury to both sides in the lead-ore hearing to submit documentary testimony, to be closed in 15 days, has brought out a mass of information upon the subject pro and con. The limit of time will expire the latter part of the present month. Assistant Secretary Tichenor and the Solicitor of the Treasury will then go over the material to ascertain whether any new points of information or argument have been presented which did not appear in the arguments before the Secretary two weeks ago. The home producers then went on to show that the silver ore shipped into the United States from Mexico is really lead ore; that while the component metal of chief value was silver and therefore would be free, the article of greater weight is lead and hence subject to a duty of 1½ cents a pound. It is too soon to undertake to say what may be the end of the investigations of the Department, but the indications are that the free admission of silver ores with more than 5 per cent. of lead as silver ore will be stopped. It is possible that the Department may fix the maximum of lead in the ore to take it out of the free list at a trifle higher per cent. It is certain that some decision will be rendered which will prevent the importation of silver ores free for the purpose of supplying home smelters with lead ores without payment of duties and thus interfering with the American lead-ore producers.

The same question has been agitated in the case of many iron-ore producers and manufacturers of pig-iron, the former favoring a higher duty on foreign ores, and the latter in some cases favoring a lower duty on such ores, on the plea of mixing to improve the pig. The present administration of the Treasury will sustain a consistent policy of protection right through and not maintain duties on an article at the expense of its raw material.

The controversy over woolen and worsted cloths has been closed, and the result will be a decision placing worsted cloths in the same classification as woolen cloths, increasing the duties on the former. The Solicitor of the Treasury has submitted his report on this question to the Secretary. The report may be looked for in a few days. The lead-ore question will then be taken up and will be pushed to an early decision.

### DUTY ON STEEL CROP-ENDS.

The Department makes official announcement of the verdict against the Government in a case of duty on crop-ends. In his instructions to the Collector at New York the Secretary says: "The question involved in this case was whether certain steel crop-ends were dutiable at the rate of ¾ of one cent per pound for 'scrap-steel,' as classified by the Collector, or at the rate of 45 per cent. ad valorem under the further provision for 'steel not specially enumerated or provided for in this act,' as claimed by the plaintiffs, the importers. The merchandise consisted of pieces or ends cut from steel rails in the process of manufacture in order to make a perfect rail and ends of steel blooms. The plaintiffs claimed that it was not covered by said provision for 'scrap-steel,' because it is prescribed in said paragraph that 'nothing shall be deemed . . . scrap-steel except waste or refuse . . . steel that has been in actual use, and is fit only to be remanufactured,' it being alleged that the merchandise had not been in actual use, and consequently was not the scrap-steel covered by the said paragraph. The United States Attorney reports that notwithstanding the fact that he contended that the mer-

chandise was liable to duty as scrap-steel under decisions of the United States Supreme Court, the court ruled that as the merchandise had not been in actual use, as it was cut off in the ordinary process of manufacture, it did not come within the said decision, and thereupon directed a verdict for the plaintiff. The United States Attorney further reports that the ruling of the court is in accordance with the opinion of the United States Attorney-General and the decision of the United States Supreme Court, and that in his opinion it is correct and should be acquiesced in. Upon submitting the matter to the United States Attorney-General that officer advises acquiescence, and certifies that no writ of error shall be taken by the United States." The Department, in concurring in the decision, directs the liquidation of other entries where the time has not expired.

### PERSONAL.

F. M. Clark has resigned his professorship at the Massachusetts Institute of Technology, of Boston, Mass., and will hereafter devote himself to professional work in mining and metallurgy, with headquarters in Chicago.

Leonard Peckitt, for some years chemist of the Reading Iron Works, at Reading, Pa., has accepted a similar position with the Allentown Iron Company, of Allentown, Pa.

John E. Fry, for some years superintendent of the Wheeling Steel Works, at Wheeling, W. Va., has resigned his position and has been succeeded by C. S. Arnburg, of Illinois. Mr. Fry has not yet decided where he will locate, but will visit Springfield, Ohio, and other points before locating permanently.

Isaac Block, of the firm of Block, Pollock & Co., Chicago, sails for Europe June 1. He will be away about six months, spending much of his time at the popular resorts in Germany for the benefit of his health.

Engineer C. C. Martin, of the Brooklyn Bridge, sailed for London to attend the convention of the Society of Civil Engineers.

Commissioner A. L. Fink, of the Trunk Line Association, sails for Europe very shortly for his usual summer vacation.

O. F. Nichols, general manager of the Brooklyn elevated roads, is a graduate of the Rensselaer Polytechnic Institute, at Troy, N. Y., and a civil engineer of wide repute.

Henry McCormick, of Harrisburg, Pa., sailed for Europe yesterday, accompanied by his wife. Their two sons, now at college, will follow them in a month or so.

The experiments in the economy of burning powdered coal side by side with natural gas, at the works of Moorhead Bros. & Co., in Pittsburgh, on Monday, are said to have been successful so far as they went. Among those present were G. W. Lord, of the Diamond State Iron Company, Wilmington; T. M. Stammer, of the Cambria Iron Company; George Coleman, of the Niles Iron Company; Mr. Maxwell, of Long & Co., and others. Erastus Wiman and J. G. McAuley, who control the process, were also present. The amount of coal consumed in the first test was 684 pounds and the amount of iron heated was 4600 pounds. The charge of natural gas is at the rate of \$1 per ton of iron, while the cost under the new process, it is claimed, would not exceed, including pulverization, 50 cents per ton of iron. Owners of the furnace will continue the device in practical operation for 30 days, after which they will decide whether to equip their entire plant with a pulverized fuel process or continue to use natural gas.



# TRADE REPORT.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., May 28, 1889.

**Pig-Iron.**—The market shows a good deal of steadiness considering its surroundings. There is a disposition among large consumers to place orders at current rates for fall delivery, but holders are not willing to enter contracts of that kind, although they are prepared to do so for June and July. The impression that bottom prices have been reached is becoming deeply rooted, and the trade are closely watching the course of events, so that they may be in a position to avail themselves of any changes that may occur in the near future. With such a shaking up as the trade has had during the past month or six weeks, and with the steadily increasing capacity for production, there is a great deal of conservatism, even among the most sanguine. But every one feels that prices cannot, under any circumstances, go much below the figures now current, while there are great possibilities in the other direction. Consumption is undoubtedly on the increase, and although there may be more or less of a curtailment during the hot weather, there is every reason to believe that consumption during the last half of the year will be very much greater than that of the first half. Meanwhile the "blowing out" of furnaces has already decreased the supply considerably, although the effect may not be felt immediately, as there are accumulations of stocks to be worked off before the adjustment between supply and demand is complete. But the market has broadened to such an extent that it cannot be gauged as closely as in times past, owing to the wider field which it covers. Chicago looms up as an important center, and in fact nearly all the large cities west of Pittsburgh are in the aggregate becoming consumers of vast importance. The new Southern furnaces are so located that a variation of 25¢ or 50¢ per ton at any particular point enables them to turn their attention to it at once, so that contingencies which in former times led to sharp advances would now have very little effect. Under the conditions now prevailing advances and declines will of course be met with as before, but the fluctuations will be less frequent and less violent. The trade have felt this change coming for some time, and in fact the apathetic feeling which so generally prevails is in no small degree the result of these new conditions. For these reasons, therefore, consumers are very conservative and are not likely to carry things to any such extremes as during the boom of 1879 and 1880. A better market is confidently expected, but so far as this vicinity is concerned there is a disposition to keep in line with other markets, unless actual requirements force consumers to place orders at advancing prices. For the present, however, things are just about as they were a week ago. The undertone may be a little stronger, but for all practical purposes prices are unchanged, although bids for fall deliveries are not generally accepted at the figures named for June and July. Quotations for tidewater deliveries vary from \$17 to \$18 for standard to choice brands of No. 1 Foundry, \$16 @ \$17 for No. 2 and \$14 @ \$15 for Gray Forge. Southern Iron and brands not strictly up to standard may be picked up once in a while at about 50¢ per ton less money, but there is not much demand, and under any pressure to realize still lower figures would probably have to be accepted, as buyers are not inclined to take anything that is not absolutely in ac-

cordance with their ideas as regards both price and quality.

**Blooms.**—The demand is only fair, and prices barely steady, with sales chiefly within the following limits: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck Bars.**—The market is again somewhat in sellers' favor. Several lots were picked up a few days ago at about \$27 at mill, but latest transactions were at \$26.50 at mill, and at \$27 Philadelphia. Some hold for \$27.50 delivered, with nothing available to-day at less than \$27.

**Bar-Iron.**—The demand is improving and the majority of the mills are now employed pretty well up to their full capacity. Prices are a shade better, but still very low, without any special indication of much improvement for the present. There is a good inquiry, however, and at the low prices recently ruling there would be no difficulty in securing some very large orders, but as the mills are provided with work well up to midsummer they are disposed to await developments before taking anything beyond that, unless some advance in prices can be secured. Ordinary quotations are 1.75¢ @ 1.80¢ for Best Refined Bars, but there is some irregularity yet, and on desirable orders cutting in extras is very general. Skelp Iron begins to move again, with sales of Grooved at about 1.75¢ and Sheared at 2¢, delivered.

**Plate and Tank Material.**—There is a continued good demand for Plates, and mills are all comfortably supplied with orders. The number of inquiries coming in and the general outlook for business are considered of a most encouraging character, so that sellers are inclined to ask more money for their product. The continued firmness of prices has resulted in a gradual advance of about a tenth from the lowest, with indications of further improvement in the near future. Quotations about as follows: 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.1¢ for Universal Plates; Shell, 2.3¢ @ 2.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.25¢; Shell, 2.5¢; Flange, 2.4¢ @ 3¢; Fire-Box, 3.1¢ @ 4¢.

**Structural Material.**—The same general remarks would apply as under the previous heading. Mills are all fully employed, and as a rule at somewhat better prices than ruled earlier in the season. The outlook is such as to warrant the expectation of steadily improving prices, which for the present are about as follows: Bridge Plate, 2¢ @ 2.05¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—The demand is said to be quite satisfactory, and mills are fully employed in meeting the demands made upon them. Inquiries are coming in from all sections, and it is not unlikely that there will be some scarcity before the season is over. Prices are firm as follows:

Best Refined, Nos. 14 to 20. .... 3¢  
Best Refined, Nos. 21 to 24. .... 3.20¢  
Best Refined, Nos. 25 to 26. .... 3.40¢  
Best Refined, No. 27. .... 3.50¢  
Best Refined, No. 28. .... 3.60¢  
Common, ¼¢ less than the above.  
Best Soft Steel, Nos. 14 to 20. .... 3½¢  
Best Soft Steel, Nos. 21 to 24. .... 3¾¢  
Best Soft Steel, Nos. 25 to 26. .... 3¾¢  
Best Soft Steel, No. 27. .... 4¢  
Best Bloom Sheets, ¼¢ extra over the above prices.  
Best Bloom, Galvanized, discount. .... 65 %  
Common, discount. .... 67½ %

**Steel Rails.**—There is a very unsettled feeling in this department, and it is hard to say what would be the actual selling prices on offers for large lots. About \$27 @ \$27.50 at mill is asked, but at other

points \$26 @ \$26.50 is mentioned as being nearer to the actual market. Quotations, therefore, are nominally as above quoted.

**Old Rails.**—The market is dull but steady on the basis of last week's prices. Sales are reported at \$23 for T's, delivered at mills near the city, and \$22 bid for spot lots.

**Scrap-Iron.**—There is no change in this department. Prices are steady, with sales within the limits named below, as follows: \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—Business continues favorable to the selling interests and prices show increasing strength. Discounts as follows: Butt-Welded Black, 52½ ¢; Lap-Welded Black, 65 ¢; Butt-Welded Galvanized, 45 ¢; Lap-Welded Galvanized, 52½ ¢; Boiler Tubes, 60 ¢.

**Nails.**—The market is steadier than it has been for some time, but there is still a good deal of irregularity in outside brands. Steel Nails are firmer and command comparatively good prices, but Iron Nails of standard quality remain at about \$1.80 @ \$1.85 for carload lots, and \$1.90 @ \$2 for lots from store.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street, (CHICAGO, MAY 27, 1889.

**Pig-Iron.**—Some dealers report a more active market both in sales and inquiries, while others complain of the extreme quietness. The feeling that there will be an improvement in business the last half of the year is spreading and strengthening, and this constantly adds consumers to the list who have been and are now making inquiries for large blocks of Iron to cover deliveries for the balance of the year. Sales agents who are most firm in their belief of a better business repudiate the idea of lower prices, and contend that large contracts cannot be placed at less than carload orders, but there is another class whose faith would not be strong enough to stand much temptation. There is no scarcity of Iron in any grade, and the fact that the supply is abundant and some grades pressed upon the market by the weaker furnaces holds in abeyance large buyers who are inclined toward placing orders for long-time delivery at present prices. There is considerable effort on the part of Southern furnaces to market their product in this territory, and sales of small quantities are reported at figures supposed to be too low to net the manufacturers a profit. The price of local Irons suffers in consequence, but not enough has been sold at a reduction to warrant any change in our quotations. The cuts which were made are claimed to be in exceptional circumstances. We quote as follows for cash, f.o.b. Chicago: Local Coke, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, \$16.50; Lake Superior Charcoal, \$18.50; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$16; No. 2 Foundry and No. 1 Soft, \$15; No. 3 Foundry, \$14.50; No. 2 Soft, \$14.25; Gray Forge, \$13.50 @ \$14; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; Alabama Car-Wheel, \$25.

**Bar-Iron.**—Orders during the week consisted almost exclusively of small lots. Implement and wagon manufacturers are making occasional inquiries for lots covering three to six months' delivery, but find the market in such an unsettled condition that they do not place their orders. Prices

are weak and no uniform quotation can be relied upon. Nearly every manufacturer is governed by the amount of work on hand and financial condition. Jobbers have pretty full stocks, from which they are able to supply most of the orders they are receiving. Jobbers' prices from store range from 1.75¢ to 2¢, according to quality. Common Iron is quoted at mill at 1.45¢, half extras; Single-Refined Iron, guaranteed tensile strength, 1.70¢.

**Structural Iron.**—There appears to be a great deal of figuring done in this branch of trade. Manufacturers say that they have to work so close to cost that when they get a job they frequently have a loss when it is completed. They have no complaint to make against the quantity of work that is in the market, but contend that it is impossible to get a job of work that pays them for the material and labor. Mill lots are quoted f.o.b. Chicago as follows: Angles, 2.12¢ @ 2.15¢; Universal Plates, 2.15¢ @ 2.20¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. Small lots from store are sold at 2.25¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees and 3.40¢ for Beams.

**Plates, Tubes, &c.**—The demand for Steel Plates is reported very fair and no disposition on the part of manufacturers to accept orders at less than prevailing prices. Consumers of Wrought-Iron Pipe seem to be more in want of it since the price has been advanced. Manufacturers having had the nerve to advance the price indicates to many of the consumers that with an increased trade they probably would want to take another step upward and they are inclined to buy in anticipation of present wants. Quotations from store are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 5 1/4 % off for 1 1/2-inch and less and 6 1/4 % off for 2-inch and larger.

**Sheet-Iron.**—There is more firmness and a better business in this branch of the Iron trade than in any of the others. The demand for Sheets is increasing every day. Many of the mills are not taking orders for large quantities and those who are accepting orders for delivery beyond July 1 are taking them subject to cancellation in case there is a strike. Mill price for No. 27 is 2.85¢ @ 2.90¢. For Common Sheets store quotations on No. 27 range from 3.10¢ to 3.20¢, according to quality.

**Galvanized Iron.**—There was less doing last week in Galvanized Iron than the week previous. Business seems to be of a spasmodic character. Manufacturers of the better grades have instructed their agents not to press for orders. They anticipate that there will be much improvement in the business within the next six months, and they prefer taking their chances on getting better prices to accepting orders at present rates. Trade has been from store largely in bundle lots, which are quoted at 65 % off for Juniata, and 65 % and 5 % off on Charcoal.

**Merchant-Steel.**—Business consists entirely of small orders for immediate delivery. Manufacturing consumers are still pursuing the same policy of feeling the market, but do not contract for anything beyond immediate necessity. The demand for Tool Steel is greater than for any other grade, with less fluctuation in price on established brands. We make the following quotations from store: Soft Steel Bars, 2.20¢ rates; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.75¢; Open-Hearth Spring, 2.35¢ @ 2.50¢; Open-Hearth Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Steel Rails.**—Business is still confined to small orders, but on paper and under negotiation there are some large orders that encourage manufacturer in the belief that they will yet have a fair year's tonnage. Quotations range from \$29 to \$30, but the low prices made at Pittsburgh recently do not aid in sustaining these figures. The Illinois Steel Company have at present only the large mill at South Chicago running on Rails. Should contracts that are now being considered be consummated it would be necessary to start up another mill in the next two or three weeks.

**Track Supplies.**—The demand for Rail fastenings is very light. Some manufacturers have instructed their agents to not force business at the expense of prices, as they preferred to wait for a better market. The following quotations are made on small lots: Steel Fish-Plates, 1.90¢; Iron Fish-Plates, 1.70¢ @ 1.75¢; Bolts with Square Nuts, 2.55¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.95¢ @ 2¢.

**Old Rails and Wheels.**—There were no important transactions in Rails and Wheels last week. Several small lots were taken by consumers at distant points at prices that would be equivalent to \$19.50, Chicago. The demand for Old Steel Rails is very light. Short lengths are quoted at \$15.50 and long lengths at \$18 @ \$20. Old Car-Wheels are not in demand. A nominal price would be about \$16.50, but there is quite a surplus of Wheels, and there probably would be no difficulty in shading this price on round lots.

**Scrap.**—Unless there is an early and heavy movement of Scrap of all classes some of the large dealers in Chicago will have to rent additional yards. Their stocks have been accumulating so rapidly and so little is going out that the question of storage is becoming an important one. Some sales of small lots of Forge Iron, No. 1 Mill and Mixed Steel were made during the week, but the whole would aggregate only a few hundred tons. Dealers quote consumers 3/4 ton of 2000 lb as follows: No. 1 Wrought, \$17.50; Fish-Plates, \$18; Axles, \$22; Horseshoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plates, \$9; Cast Borings, \$8; Wrought Turnings, \$10.50; Axle Turnings, \$12; Mixed Steel, \$10.50 @ \$11; Coil Steel, \$13.50; Leaf Steel, \$15.

**General Hardware.**—The demand for Builders' Hardware, House-Furnishing Goods and Roofing Plates is quite good. Haying and Harvesting Tools are beginning to move more freely. Copper Goods are unchanged in price, but it is not unlikely that some change will be made soon. Novelty Clothes Wringers are now quoted at \$20 per dozen. The demand for Cutlery is improving, though too early in the season to expect much trade. In Heavy Hardware trade is very dull. Wagon-wood stocks and Carriage material are in good demand. There is a weakness in prices which makes an unsatisfactory business on the whole line.

**Nails.**—The Nail market is more unsettled than it has been for some time past. At the meeting of the Western Nail Association an attempt was made to advance the price to \$1.35, mill. The project did not receive the unanimous support of those present, and consequently nothing was done that will assist in maintaining prices. Before the meeting it was predicted that the association would virtually disband. Some portion of the penalty agreement was annulled, and from what has happened since it is presumed that manufacturers intend dealing with the subject of prices and product as best suits their individual purpose. Nails have been offered in this market in the last few days at prices so much below former figures that one is led to believe that there will be important

changes before this week closes. In carload lots jobbers are quoting \$1.90, regular terms, and in small lots \$1.95 @ \$2. Wire Nails, carload lots, are quoted at \$2.30, and small lots 5¢ @ 7¢ keg advance. Carload orders are usually for half of each kind.

**Barb Wire.**—Manufacturers are working on orders and have no stock on hand. Consequently the market is steady at 2.75¢ for Painted in small lots and Galvanized at 3.35¢, with no discount for large lots, as neither jobbers nor manufacturers want them.

**Pig-Lead.**—There was little if any change in the market last week. Sales of some 400 tons are reported at 3.70¢ for spot and future delivery.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, May 27, 1889.

**Pig-Iron.**—There is very little to offer beyond the fact that the atmosphere appears to be clearing up a little and a somewhat better feeling prevails. Inquiries are more frequent, and it is probable that more sales are being effected. The stocks are gradually being shipped away, and the yards are clearer at the present time than for some weeks past. It would be difficult, however, to establish a definite figure as the basis of the market, as the prices at which different lots are being sold vary considerably. There are some brands of Southern Irons that are bringing \$17.50 in New York, while others are being sold as low as \$16.50; and the same rule applies to many of the inland sales through the West and South, though the spring sales to the Southern furnaces fell off a little, evidently showing a falling off in business, but for the past two weeks sales to the Southern districts have increased considerably. The Pipe furnaces that are located South report a greater demand than ever for Water and Gas Pipe, and they are all crowded with orders. This of course affords a source of large consumption for Southern Pig-Iron, and their orders are beginning to be of considerable importance to the Southern furnaces. Upon the whole the outlook is brighter than it has been during the past month or two.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, May 27, 1889.

**Pig-Iron.**—The past week has witnessed further depression in the local Pig-Iron market. There has been more pressure to sell, and lower prices have resulted. Those most interested unite in the assertion that the level now reached is the lowest which has been touched in the past ten years, while some hazard the opinion that the lowest prices ever experienced have been made during the week under review. Gray Forge has been sold at \$12.50, No. 1 Southern Foundry at \$14.50, No. 2 ditto at \$13.75, and No. 3 ditto at \$13. There are also rumors of sales of No. 2 Foundry at \$13.50 for 600 tons, cash, prompt shipment, but this is regarded as a forced sale. As a rule trading has been light, of a hand-to-mouth character, but in a few instances buyers have overstepped the ordinary bounds of conservatism, and with temerity placed orders to cover contracts running from two to ten months. The Lafayette Car Works are said to have bought 13,000 tons Soft Foundry Iron at low prices, and a Northern concern has taken 3500 tons Lake Superior Car-Wheel Malleable Iron at about \$20, cash, here, for delivery extending through ten months. Other buyers have bought 1000 tons Gray Forge at \$12.50 and 1000 tons No. 2 Southern Foundry at \$13.50, spot cash. Freight

rates from Northern stacks to the Pittsburgh district have been reduced 15¢, giving such furnaces some little advantage within a limited range. Production of Pig-Iron is being gradually reduced, and not until it shall have dropped below the level of consumption can a permanent turn for the better be reasonably expected. The month of April showed a surplus, but the record of May will probably give statistics more favorable to producers of Pig-Iron. The following are the approximate prices current here at the close for cash, f.o.b.:

**Foundry.**

Southern Coke, No. 1 (new classification).....	\$14.75 @ \$15.25
Southern Coke, No. 2 (new classification).....	14.00 @ 14.50
Southern Coke, No. 3 (new classification).....	13.25 @ 13.75
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 1.....	20.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1.....	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2.....	16.50 @ 17.00

**Forge.**

Strong Neutral Coke.....	12.75 @ 13.00
Mottled Neutral Coke.....	11.75 @ 12.00
Gray Forge.....	12.50 @ 12.75

**Car-Wheel and Malleable Irons.**

Southern Car-Wheel.....	20.00 @ 24.00
Hanging Rock, Cold Blast.....	22.00 @ 26.00
Lake Superior Car-Wheel and Malleable.....	20.00 @ 21.00

**Manufactured Iron.**—There has been some little increase in the demand for Bar-Iron recently, but prices are barely sustained.

**Nails.**—A weaker tone has prevailed, and lower prices have been accepted, with a moderate demand. Steel Nails, 12d and 40d, sell at \$1.80 @ \$1.90  $\frac{1}{2}$  keg, with 10¢ rebate in carload lots at the mills, and Steel Wire Nails at \$2.40 @ \$2.50  $\frac{1}{2}$  keg.

**Old Material.**—There has been little trading. Old Rails are quotable at \$20, spot, and small lots have sold at this rate. Old Wheels have been unsettled, with sales recorded at \$15 @ \$16, cash.

**Cleveland.**

CLEVELAND, May 27, 1889.

**Iron Ore.**—Only a moderate amount of Ore has been sold during the past week. High-grade Gogebic Bessemer at \$5.25, Cleveland delivery, has found a ready market, and the Aurora Mine has made several sales at that figure. Non-Bessemer Ores seem a little weaker, and the range of prices has declined to \$3.50 @ \$4, with only a few particularly rich grades commanding the latter figure. The Pittsburgh and Mahoning Valley furnace men are expected to enter the market this week with substantial orders. Ore is still being pushed forward from the mines at a tremendous rate, over 1,000,000 tons having already been shipped, against less than 400,000 tons up to a corresponding period last year. Although the tonnage demand is heavy, there is no change in lake freights, and vessels are still being engaged at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland and Two Harbors.

**Pig-Iron.**—Prices are not improved, but considerable Iron has been sold during the past week. These sales have included about equal quantities of Foundry and Mill Irons, but the prices paid furnish no basis for an estimate of actual quotations for round lots of Iron. Buyers ask for quantities so small that stocks are but slightly reduced, even with an almost constant demand.

**Manufactured Iron.**—There is a steady demand for combination shapes, and particularly for the smaller grades of Channels. Common Bar-Iron is still selling at 1.60¢, with only a fair inquiry reported.

**Scrap-Iron.**—A few sales of old American Rails at \$21 are reported, although buyers are asking \$21.50. Old Axles, at \$23, are selling freely, but there is little call for Wheels.

**Pittsburgh.**Office of The Iron Age, 77 Fourth Ave. {  
PITTSBURGH, May 28, 1889. }

A good deal is being said and written in regard to the general Iron situation, and there is a wide conflict of opinion in regard thereto. That the volume of business is increasing there is no doubt, but as yet there is no improvement in prices, which are irregular and unsatisfactory. General business hereabouts will compare well with what it was at this time last year, and our manufacturing interests, with the exception of Iron and Steel, are in better condition.

The labor outlook is unsettled, and as regards the Iron business it is difficult to foretell at present what the outcome will be. There is not much doubt that the rest of the Pittsburgh manufacturers will follow in the wake of Carnegie, Phipps & Co. and demand a reduction in the wage-scale, but it is not likely that the Amalgamated Association will submit to a reduction without a struggle. Carnegie, Phipps & Co. are very determined in their demands from the men employed at the Homestead Mill, and they want to know by the close of this month what the men propose to do. If their men refuse to accept the reduction the firm will have to do one of two things—shut down the mill or run it with non-union men. Carnegie, Phipps & Co. say it is simply out of the question for them to continue to pay the present wage-scale and compete with other mills paying considerably less. The Allegheny Bessemer Company's mill, at Duquesne, is being operated by non-union men, which means success for the company, as the great object sought after was to make it a non-union mill. The leading and active members of the firm, Messrs. Park and Clarke, have for years been very much opposed to organized labor, and they were determined to make the mill at Duquesne non-union.

The reduction in the freight rate on Iron Ore from the lakes to Pittsburgh of 20¢  $\frac{1}{2}$  ton will go into effect June 1. The railroads have discovered that they must do something for the relief of the Iron interest, hence the reduction some weeks ago in the rate of Pig-Iron from the Shenango and Mahoning valleys to Pittsburgh, and now the reduction in the rate on Ore. The rate on the latter has been reduced from \$1.25 to \$1.05  $\frac{1}{2}$  ton, which is equal to about 30¢  $\frac{1}{2}$  ton on Pig-Iron.

The June meeting of the Wrought-Iron Pipe Association will take place in Pittsburgh.

**Pig-Iron.**—There has been a further decline, furnace men having already given away to a considerable extent the reduction in Ore freight. There is liable to be a spurt at almost any time, however, for just as soon as there is a reasonable assurance that the market has touched bottom there will be a largely increased demand, as consumers are all low in stock and will want to replenish. We now quote as follows:

Neutral Gray Forge.....	\$13.75 @ \$13.85, cash
White and Mottled.....	13.00 @ 13.50, "
All-Ore Mill.....	14.50 @ 15.00, "
No. 1 Foundry.....	15.25 @ 15.50, "
No. 2 Foundry.....	14.75 @ 15.00, "
No. 1 Charcoal Foundry.....	23.00 @ 23.50, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
Cold Blast Charcoal, No. 1.....	27.00 @ 28.00, "
Bessemer Iron.....	15.75 @ 16.00, "

In regard to Bessemer Pig there have been no sales reported recently; \$16, cash, is still the asking price, but there is no doubt that it can be bought for less. Buyers for this, as well as other grades,

are holding off in expectation of still lower prices.

**Spiegel.**—Is still quoted at \$30 @ \$30.50 for 20%, and Ferromanganese at \$58 @ \$58.50 for 80%.

**Muck Bar.**—There is no improvement in the demand, nor is it likely there will be as long as there is a possibility of prices going still lower. We continue to quote at \$26, cash, at which it is being offered pretty freely, but so far as we are aware there have been no sales below that figure.

**Manufactured Iron.**—The demand for Merchant-Iron is increasing, but prices show no improvement. We continue to quote first-quality Iron upon a basis of 1.60¢ @ 1.70¢ for Bars and Old Rail Iron at 1.40¢ @ 1.50¢, 60 days, 2% off for cash. Skelp Iron, for which there is a continued good demand, is steady at 1.62½¢ @ 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared.

**Nails.**—There is no change to note in the situation; business here in Pittsburgh continues light and prices for Cut Nails continue unsatisfactory; may be quoted at \$1.85 @ \$1.90, 60 days, 2% for cash. There are only two firms here paying attention to the Nail business; one quotes at \$1.85 and the other at \$1.90. Wire Nails in carload lots are still quoted at \$2.15 @ \$2.20, 60 days, 2% off for cash, and \$2.30 @ \$2.35 in a jobbing way. As stated in a former report, it is claimed by some who have made an investigation of the matter that at present prices Cut Nails are very much cheaper than Wire Nails, and it is intimated that the former sooner or later will supplant the latter. This, however, is a matter that time alone will determine.

**Wrought-Iron Pipe.**—This important interest continues much the same as noted in our last report. The mills are all busy, some of them sold several months ahead, and the combination prices are being faithfully adhered to; but it is claimed that they are low, and afford but very little margin for profit. There is a possibility of prices being advanced at the next meeting of the association, which takes place in this city next month. It may be stated that the Pipe trade is about the only branch of the Iron interest here in which there is any particular activity. We continue to quote prices as before: Discounts on Black Butt-Welded Pipe, 52½%; on Galvanized do., 45%; on Black Lap-Welded, 65%; on Galvanized do., 52½%; Boiler Tubes, 1½ inches and smaller, 57½%; do., 2 inches and larger, 62½%; Casing, 5½ inches, 62½%; other sizes, 60%; 2-inch Tubing, 13¢  $\frac{1}{2}$  foot, net; 3-inch Line Pipe, 20¢  $\frac{1}{2}$  foot; 6-inch do., 56¢; 8-inch, 90¢.

**Old Rails.**—Old Iron Rails continue neglected, but there has been no further change in prices. We are advised of sales of 700 tons at \$21.50, which for the time is the ruling price. Old Steel Rails are weaker, especially as regards short lengths, which we now quote at \$16.50 @ \$17. Long lengths remain as last quoted at \$19 @ \$19.50.

**Railway Track Supplies.**—There is a fair business, but no change in prices. Spikes, 2¢, 30 days, on cars at works in Pittsburgh; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

**Steel Rails.**—The mills here are pretty well filled up with orders, and a stronger feeling obtains in consequence; prices, however, are still quoted at \$25 @ \$26, cash, at mill, the inside figure only for desirable orders. Indeed, we are not so sure that an order would now be accepted at the inside or outside, as the mills are not as anxious for business as they were a

few weeks ago. The belief obtains that the very low price of Rails will stimulate railway construction, and that the Rail market will be better during the last half of the year.

**Blooms, Billets, &c.**—Bessemer Steel Billets may be quoted at \$26.50 @ \$27, as to size, quality and delivery; Nail Slabs, \$26.50; Rail Crops, \$17 @ \$17.25.

**Old Material.**—The demand for all kinds of Old Material continues light and prices are weak. Sales No. 1 Wrought Scrap at \$18, net ton; Old Car Axles at \$24; Wrought Turnings may be quoted at \$13; Cast Scrap, \$13.75 @ \$14, gross; Old Car-Wheels, \$18, gross.

## St. Louis.

Office of *The Iron Age*, 214 N. Sixth st.,  
St. Louis, May 25, 1889.

**Pig-Iron.**—There is no change to note in the general conditions governing this department. Trade is light and sales of small lots are occasionally made mostly for local delivery. Prices remain unchanged, and in the absence of sales of any moment are to a certain extent nominal. Regarding the future, the general impression seems to prevail that after the summer months a revival of business will be in order, and the various industries connected with the iron trade will then be in a position to buy. Careful inquiries fail to show any large accumulation of stock at the furnaces, and they all appear to be pretty well sold up, but are not disposed to book any orders for delivery after July 1, as they are desirous of receiving the advantage of any advance in prices, which they confidently expect to occur at no distant period. The stove founders anticipate a large fall trade, and while some of them have bought all the iron they will need for the next six months, there are others who have held off, for the reason that they have expected a lower range of prices. These latter will soon be in the market to replenish their stocks, and the impetus given the demand from this quarter is likely to make itself felt in regard to prices. For ordinary-sized lots we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	\$15.25 @ \$15.75
Southern Coke, No. 2 Foundry,	14.75 @ 15.25
Southern Coke, No. 3 Foundry,	14.25 @ 14.50
Gray Forge.....	13.25 @ 13.75
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	19.75 @ 21.50

### Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

### Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00
Connellsville Coke, f.o.b. East St. Louis,	\$4.55; St. Louis, \$4.70.

**Bar-Iron.**—The demand, which has been fairly strong for the past three weeks, continues to be the feature. The mills, which have been making low prices and temporarily demoralized the market, have evidently booked sufficient orders to keep them out of the market for the present at least, and as the result prices are quoted with more firmness than heretofore. Small lots from store are quoted at \$1.80; carload lots from \$1.60 to \$1.70, according to circumstances.

**Barb Wire.**—The volume of business is large, and manufacturers state they have never in the history of the trade known it to be so busy at this season of the year as at present. Jobbers who bought stocks which ordinarily would last them well into the summer have duplicated their orders, and prices are being quoted with some degree of firmness. The American Wire Company, who have been shut down for some weeks, have advertised the plant to be disposed of at sheriff's sale. Mills quote from \$2.80 to \$2.85 for

Painted and from \$3.40 to \$3.45 for Galvanized; carload lots at from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street,  
New York, May 29, 1889.

**Pig-Iron.**—Inquiries are in the market for considerable quantities of iron, and a sale of 2000 tons of Southern is reported, but most of the commission houses have found business very dull. The situation of the Thomas Iron Company is of special interest at this juncture. They have been shipping heavily of late and now have 6000 tons less on hand than three months since. The heavy orders which they are filling have obliged them to draw on their reserve capacity. They blew in one of their idle furnaces last week and will start another this week, when all their stacks will be running except one which they hold on lease, but do not expect to operate. They have withdrawn from the market for the present, and announce that the special prices recently made are only good until the end of June. Their policy after that time will then be determined by the condition of the market. Other Northern Irons are being held at old figures—namely, \$16.50 @ \$17.50 for No. 1; \$15.50 @ \$16 for No. 2, and \$14.50 @ \$15.25 for Gray Forge, at tidewater. Southern Irons are quoted at \$16 @ \$16.50 for No. 1, \$15 @ \$15.50 for No. 2 and \$14.50 @ \$15 for No. 3.

**Scotch Pig.**—Very small quantities are selling at the following rates: Dalmellington, \$19.50; Summerlee, \$21.50; Coltness, \$21.75.

**Structural Iron and Steel.**—Architectural iron works are very busy. A number of heavy contracts, involving the consumption of a large quantity of iron and steel, were secured during the past week, and still more work is in sight. Quotations are as follows, on dock: Sheared Plates, 1.95¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢.

**Plates.**—More orders have been taken in the past ten days than for the whole of the previous month, but prices are still very low. We quote on dock as follows: Iron Tank, 1.95¢ @ 2.1¢; Shell, 2¼¢ @ 2.5¢; Steel Tank, 2.2¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 2.75¢; Fire-box, 3.25¢ @ 4¢.

**Bar-Iron.**—In this line but little is doing to form a basis for quotations, which are nominally as follows for carload lots on dock: Common, 1.6¢ @ 1.7¢; Medium, 1.7¢ @ 1.75¢; Refined, 1.75¢ @ 1.9¢.

**Merchant Steel.**—Competition for business is very keen, and some of the manufacturers are credited with having made sales at prices lower than anything heretofore reported. Inferior grades of Tool Steel are selling at 6¼¢, in large lots; good brands bring 7¢ @ 7¼¢; Open-Hearth Machinery, 2¼¢; Open-Hearth Spring, 2¼¢ @ 2½¢; Crucible Spring, 3¼¢ @ 4¢. Small lots command ¼¢ @ ½¢ advance on these rates.

**Spiegeleisen.**—Nothing is doing in this line at present. Quotations are nominal at \$27 @ \$28 for 20 %.

**Wire Rods.**—Agents for foreign manufacturers are disturbed by the cessation of operations at German works on account of the strike now in progress there, which interferes with contracts that might be made for future delivery. A nominal quotation is \$42.

**Steel Rails.**—Several large contracts were closed by Eastern mills since our last report. The Bethlehem Iron Company secured the heaviest, consisting of 40,000 tons for the Oregon Pacific. This con-

tract has been the subject of negotiation for some time, and it is understood that the question of marketing a considerable quantity of the railroad company's bonds formed an important element of the transaction. The manufacturers who are in a position to combine a modicum of financing with their regular business probably have opportunities to realize better returns from such sales than if they were obliged to insist on all cash. The Lackawanna Iron and Coal Company stand next to the Bethlehem Iron Company in the magnitude of their transactions, reporting sales for the week under review aggregating 32,000 tons, of which 20,000 tons go to the Pacific Slope and the remainder to several Eastern roads. Scattering sales of a few thousand tons are reported by other mills. Altogether the week has been one of much interest to the steel rail manufacturers, who are inclined to believe that the tide has turned and the extreme depths of the depression have been passed. They are further encouraged to take this view by the large orders still under negotiation, and which they expect to see placed at an early day, amounting to at least 85,000 tons. It is estimated on good authority that 100,000 tons can safely be depended on in the West in the next six weeks, most of which will go to the Chicago mills. Efforts are being made to advance prices, as it is believed that a good foundation now exists for an upward movement if the manufacturers could be brought to act together. Quotations continue at \$26.50 @ \$27, at Eastern mills, with some naming \$28 for delivery after September 1, to which time their capacity is fully covered.

**Track Supplies.**—Dealers are anticipating an early revival of activity in this line in consequence of the recent heavy sales of Rails. Fish-Plates are quoted at 1.80¢ @ 1.90¢, with some sellers naming 1.85¢ as their bottom rate; Track Bolts with Square Nuts, 2.70¢ @ 2.75¢; with Hexagon Nuts, 2.80¢ for Common Iron and 3¢ for Refined Iron; Spikes, 1.90¢ @ 2¢, according to quality.

**Old Material.**—A better movement is reported in Wrought Scrap, but at very low prices. Considerable quantities of No. 1 have been sold at \$20 gross ton, delivered at Jersey City and Brooklyn. Of Old Iron Rails the only sale reported was a lot of 500 tons, which brought \$22. Inquiries for Old Rails are being received from Ohio consumers, who contemplate securing a supply for future wants while prices are low. Stocks are light, but a few thousand tons now remaining in bonded warehouses, and as they have been held for some time the owners will hardly part with them at present rates. Old Steel Rails are in fair demand, with bids of \$17.50, Jersey City. Old Car-Wheels are flat, with latest sales at \$19 @ \$20. Turnings are quoted at \$13.50 @ \$14, delivered; Cast Scrap, \$15 @ \$16; Cast Borings, \$9.50 @ \$10.

## Financial.

In commercial circles there is rather more animation, and as compared with the corresponding date last year the volume of business in the country at large is increased. In the West and Northwest there are several large reported gains, and in New York City the more active speculative movement is strongly reflected. Still the feeling generally is conservative, influenced by the low range of prices. At industrial centers a readjustment of wages is being effected in some instances, causing more or less disturbance. The proposed reduction at Carnegie & Co.'s now substantially agreed upon is about 20 per cent. Rather more attention is being given to the silver question, as foreign bankers in time contracts



for money now insert a clause specifying payment in gold. Touching this subject the *Financial Chronicle* says: "We acknowledge we have ourselves begun to think that it matters little what future action Congress takes with regard to silver unless it is willing to suspend the present coinage. As matters are now going we are already on the down grade toward the white metal, and will no doubt reach that level for our currency whenever a prolonged depression in business occurs." At the same time there is an abiding conviction among the conservative class of financiers that Congress will interpose to preserve the basis of valuation as it exists to-day. Remark has been excited by the small offerings of Government bonds, and the possible inadequacy of this resort as a means of disbursing the accumulating surplus, but Secretary Windom is believed to be master of the situation at least for months to come.

On the Stock Exchange the market opened more actively and stronger, influenced by favorable crop reports, easy money and confidence in the general situation. Gold exports had no perceptible effect. The grangers led in the speculation, with St. Paul and Northwest most prominent. A rumor obtained currency that the manufacturers' prices of steel rails would be advanced. On Monday the movement was more restricted as to volume, but there was much irregularity caused by buying and selling in quick succession. The reactions were generally due to realizations, London taking a part. On Tuesday the market was more active and stronger, San Francisco common, St. Paul and the other grangers continuing to lead, and one feature was a rise in Lake Shore, in Michigan Central and in Canada Southern. The tone was strong in the late trade and at the close. There was good buying of Chesapeake and Ohio common.

United States bonds are quoted as follows:

U. S. 4½, 1891, registered.....	106½
U. S. 4½, 1891, coupon.....	107½
U. S. 4, 1897, registered.....	129½
U. S. 4, 1897, coupon.....	129½
U. S. currency 6s.....	121½

The market for sterling was dull and steady. Posted rates closed at 4.88 for 60 days and 4.89½ for demand.

The Government returns of the foreign commerce of the United States for April show a balance against this country of only \$2,500,000, as compared with upward of \$11,000,000 for April, 1888. The total exports were \$65,544,575 and the imports \$68,057,697. For ten months ending April 30 the comparison is as follows:

	1888.	1889.
Total exports.....	\$65,088,387	\$69,262,411
Total imports.....	67,328,261	68,630,512
Excess of exports.....		\$2,234,150
Excess of imports.....	\$22,239,874	

The continued shipments of specie despite this showing evoke various explanations. "The true explanation," the *Journal of Commerce* says, "is undoubtedly to be found in the apprehensions entertained in Europe, and especially in Great Britain, concerning the action of our Government on the silver question, and its effect on capital owned abroad and loaned or invested here. . . . This distrust of our market is likely to increase instead of diminishing when the policy of the silver men is more fully exposed."

According to the Custom-House report the exports of specie last week amounted to \$4,816,735. Since January 1 the total is \$27,667,700, as compared with \$16,835,000 for the same time in 1888. The exports of specie for the week were \$100,000, and the total since January 1 is \$3,579,000, against \$4,919,000 for the same time last year. Saturday's steamers took out \$4,000,000.

The weekly statement of the associated

banks shows a steady gain in reserves, despite the loss of gold by shipments to Europe, the surplus now being \$15,055,350. An addition of \$978,025 was unexpected. In loans there was a contraction of \$612,300. Specie decreased \$1,287,000, and legal tenders increased \$1,884,200. Deposits decreased \$1,503,300. It is remarked that a year ago gold exports were larger than now. Bankers report that money was never easier than at the present time. One loan of \$250,000 for four months was at the rate of 3½% on single-name paper without collateral. Rates are 3 @ 3½% for 30 to 90 days and 3½ @ 4% for four to six months. Commercial paper is scarce, and the quotations are 8½% for indorsed bills receivable and best city names and 4½ @ 6 for single names. The total bank clearings of 39 cities last week show an increase of 23.4% compared with last year. Outside of New York the gain was 12.8%. New York increased 29.5%.

In general merchandise the market is quiet, as if awaiting more stability in prices. In breadstuffs and wheat some parties are willing to sell a shade lower and shippers have taken hold rather more freely. Corn was pressed for sale. Exports from New York comprised 181,000 bushels of wheat and 710,000 bushels of corn. Raw sugar advanced ¼¢ and in refined business is much larger, without change of quotations. New Texas and Michigan wool is coming into market. Cotton is firm and in active demand. The trade sale of colored cotton goods in this city realized about \$1,500,000, prices averaging better than anticipated, although about 7½% below the regular. More than any other event of the season the flannel sales have been looked forward to with keen interest. The prices realized seemed to show an advance of 2½ to 5 per cent. above the prices at last year's sale and within about that range below agents' net prices of the present season. The importation of merchandise at this port during the week amounted to \$7,030,000, of which \$1,327,000 represents dry goods. Since January 1 the total is \$202,276,500, as compared with \$197,051,000 for the same time in 1888 and \$191,782,000 in 1887. Exports amounted to \$6,000,000.

The annual report of the Produce Exchange shows that net receipts were \$269,388, and that the surplus is \$70,170. The gratuity fund amounts to \$1,086,767. The site chosen for the Appraisers' Stores is condemned.

The Scranton City Bank, of Scranton, Pa., is in the hands of an assignee. A dispatch says there is due depositors \$322,000, and that the assets are trifling, mostly on paper.

## Coal Market.

The June schedule for Anthracite Coal as agreed upon in this city last week is as follows: Steamer and Broken, \$3.85; Egg, \$4; Stove, \$4.30; Chestnut, \$4, f.o.b. In anticipation of this movement there was a temporary stir among buyers, so that more activity in the trade was apparent than for some time past, but the usual quietness again prevails, and no business of any importance at the advanced prices will be looked for immediately. There is considerable urgency in forwarding Coal privately purchased, under apprehension that freight rates may be increased, as the scarcity of vessels continues. The production of Coal at the mines is being gradually increased, the total for the week ending May 25 being 708,000 tons, as compared with 678,000 tons for the previous week and 652,600 for the same time last year. Since January 1 the aggregate is 11,502,750 tons—a falling off of nearly 1,500,000 tons compared with 1888.

The official statement of Anthracite

production for April has come out in its abbreviated form. Output by regions for the month compares with output for the same month last year as follows: Wyoming, 1,148,455 tons; decrease, 858,781; Lehigh Valley, 476,202; increase, 106,807; Schuylkill, 619,542; decrease, 289,800. Total for month, 2,274,199 tons; decrease, 582,394 tons. Total for year to date, 9,097,453 tons; decrease, 1,228,888 tons. The stock on hand at tidewater shipping points on April 30 was 964,628 tons; increase, 65,845 tons during month.

Now that the several companies connecting with the Poughkeepsie bridge have been virtually consolidated and that other arrangements for business for the new route are nearly complete, the expected diversion of Coal traffic will be watched with interest. Bituminous Coal is unchanged.

The Bell, Lewis & Yates Company have been awarded the New York Central and West Shore contract for Coal for delivery at Buffalo and Rochester for the ensuing year, 400,000 tons. The same concern has the contract for the Michigan Central road, 110,000 tons.

The Waddell Colliery, at Miners' Mills, near Wilkesbarre, employing 400 men and boys, was sold on Saturday to Parke & Watkins for \$50,000 cash.

## Metal Market.

**Copper.**—Since our last report it was cabled from Paris, under date May 23, that the delegates of American Copper mines with the exception of the Tamarack representatives have ratified the provisional arrangement concluded with M. Moreau, the liquidator of the Comptoir d'Escompte, but that the arrangement is binding on all parties interested even without the Tamarack adhering to it. M. Moreau was to have an interview with the agents of the English mines, and the *Temps* is of the opinion that an understanding with them is probable. The Rio Tinto, it was added, had given their assent. What precedes relates to claims for differences against the Comptoir d'Escompte in liquidation. Since then nothing further has transpired about the old syndicate's surplus supply which is being carried here by bankers. It is stated that efforts continue being made to have it shipped abroad, but that for the present holders are unprepared to follow the suggestion. At any rate there is no Lake Ingot obtainable from the mining companies under 12¢, at which moderate deliveries are made, while outside buyers have to pay 12½¢ @ 12½¢ as to quantity, and casting brands sell at 11½¢ @ 11½¢. In a speculative way September Lake brought 11½¢. Under the stimulus of an active consumptive demand London advanced from £39. 15/, spot, at the time of our last week's report to £41. 5/ yesterday, and futures from £39. 10/ to £41. 5/; sales, 1300 tons. During the first quarter the shipments of Pyrites from Spain reached 257,909 tons, against 195,735 in 1888 and 197,425 in 1887; of Precipitate they were 6358 tons, against 6168 and 7215. The import of Copper into Liverpool and Swansea from the United States from January 1 to May 16 was 11,181 tons Fine, against 11,154 in 1888 and 1789 in 1887. The general impression in New York is that the position of Copper will after awhile regulate itself by diminished production. Copper closed on the Metal Exchange to-day at 12.45¢, asked.

**Tin.**—Has been ill-sustained during the week on the spot in the London market. At the time of our last report spot stood £93. 17/6 and reached £92 yesterday, whereas futures improved from £92. 10/ to £93, sales aggregating 500 tons. Here the volume of trade has been quite restricted, 10 tons spot selling at 20.40¢ and



## GERMANY.

HAMBURG, May 18, 1889.—*Iron*.—The strikes in the Rhenish-Westphalian coal region have for the moment upset the regular trade in Iron and Steel there; quotations, though firm, are therefore more or less nominal. To judge from the orders now arriving from the United States the stock of Spiegel there must be very much reduced, and 66 marks per ton for 10 to 12% has been obtained without difficulty. The English demand for higher-grade Spiegel has also been on the increase. Forge Pig has been advancing rather too fast of late. Orders have been received for delivery all the way to November 1. The present quotation is 58 marks; for Bessemer on the West Coast, 50/6, and for Luxembourg, 36/ @ 43/. The price of Boiler and Tank Plates has been raised to 185 and 160 respectively, being an advance of 5 marks. The Wire branch has remained dull and unaltered. The nominal quotation for Wire Rods is 110 @ 120; Steel Rails, 120 @ 125, and in a few instances higher.—*Borsenhalle*.

## BELGIUM.

BRUSSELS, May 18, 1889.—*Iron*.—The Belgian markets have remained firmly sustained during the week. Structural Iron works have booked a good many fresh orders; the rolling-mills continue very busy. Steel works decline further engagements, being loaded down with contracts for many months to come. The demand for Steel Rails has gone on improving. French competition in the Finished-Iron trade is still felt to some extent in the Charleroi basin, and the latter, in its turn, competes at Liège. The Iron and Steel movement in Belgium during the first quarter has been as follows:

Imports.		Exports.	
1889.	1888.	1889.	1888.
Tons.	Tons.	Tons.	Tons.
Iron Ore.....	419,370	389,033	24,434
Ingot-Steel...	284	424	1,208
Steel Rails...	116	88	16,083
Other Steel...	670	603	5,122
Wrought-Steel	333	67	1,346
Pig-Iron.....	71,572	52,735	1,520
Scrap-Iron...	6,624	5,769	1,425
Iron Wire....	883	922	1,255
Iron Rails...	114	68	1,862
Sheet-Iron...	452	450	11,874
Other Iron...	4,506	1,833	56,105
Wrought-Iron.....	106	135	3,030
Nails.....	1,049	948	7,083
Castings.....	493	172	4,461

Totals.. 506,572 453,247 136,847 130,011

—*Moniteur des Intérêts Matériels*.

**Steamer Speed on the Lakes.**—The fine steel freight steamer Owego has just made the run from Buffalo to Chicago in the unprecedented time of 58 hours. As the distance between the ports named is 889 miles, it will be seen that in order to accomplish the run in 58 hours the Owego had to make an average speed of 15½ miles an hour. The Milwaukee *Wisconsin* says: "Nothing could more clearly illustrate the immense strides taken by the shipping interest of the great lakes during the past decade than this achievement of the Owego. The speed of our large freight carriers during the '70s ranged from 9 to 10 miles, with perhaps ability on the part of a few steamers to accomplish 12 miles during spurts when in proper trim. Nowadays the Owego, the Chemung, the Jewett and a number of other freighting steamers of large size are accounted good 14-mile boats. This increase in the steaming ability of the heaviest of our lake steamers is an important factor in the competition between the rail and water routes. Tonnage with improved engines is worth nearly 50 per cent. more in carrying ability than it was ten years ago; and the water route for freight to the seaboard is now more attractive to shippers than it has ever been. In time the commercial navy of the great lakes will be equal to the best that may be cited on the salted seas."

Gen. John Hammond, of Crown Point, N. Y., died on the 28th inst. of consumption. He was president and chief owner of the Crown Point Iron Company. During the civil war he was colonel of the Fifth New York Cavalry. He was a member of the Twenty-sixth Congress from the Essex and Franklin district.

## French and American Glass.

## FRENCH GLASS.

Per Box 50 feet.

Sizes	Single.			
	1st.	2d.	3d.	4th.
	EFH	IEH	HH	HB
25 6 x 8 to 10 x 15.....	\$10.50	\$9.00	\$8.50	\$8.00
40 11 x 14 to 16 x 24.....	11.50	10.75	10.25	9.75
50 18 x 22 to 20 x 30.....	15.50	14.00	13.50	12.50
54 15 x 36 to 24 x 30.....	16.50	15.00	14.50	.....
60 26 x 28 to 24 x 36.....	17.75	16.25	14.75	.....
70 26 x 36 to 26 x 44.....	19.00	17.50	15.25	.....
80 26 x 46 to 30 x 50.....	21.00	19.50	17.00	.....
84 30 x 52 to 30 x 54.....	22.00	20.25	18.00	.....
90 30 x 56 to 34 x 58.....	23.00	21.25	19.00	.....
94 34 x 58 to 34 x 60.....	24.00	22.75	21.00	.....
100 36 x 60 to 40 x 60.....	26.50	24.50	22.00	.....

Sizes	Double.			
	1st.	2d.	3d.	4th.
	EFH	IEH	HH	HB
25 6 x 8 to 10 x 15.....	\$13.00	\$12.50	\$12.00	\$11.50
40 11 x 14 to 16 x 24.....	16.00	15.00	14.50	.....
50 18 x 22 to 20 x 30.....	20.50	19.50	18.50	.....
54 15 x 36 to 24 x 30.....	21.00	20.75	19.50	.....
60 26 x 28 to 24 x 36.....	25.00	23.00	21.50	.....
70 26 x 36 to 26 x 44.....	26.00	25.00	23.00	.....
80 26 x 46 to 30 x 50.....	28.00	26.50	24.50	.....
84 30 x 52 to 30 x 54.....	30.00	28.00	26.00	.....
90 30 x 56 to 34 x 58.....	31.00	30.00	28.00	.....
94 34 x 58 to 34 x 60.....	32.50	31.00	29.00	.....
100 36 x 60 to 40 x 60.....	36.00	32.50	30.00	.....

Sizes above—\$15 per box extra for every 5 inches Discount—80% 10%.

## AMERICAN GLASS.

Price Per Box of 50 Feet.

United Inches.	Sizes.	Single.			
		AA	A	B	C
		AA	A	B	C
25 6 x 8 to 10 x 15.....		\$10.50	\$9.00	\$8.50	\$8.00
40 11 x 14 to 16 x 24.....		11.50	10.75	10.25	9.75
50 18 x 22 to 20 x 30.....		15.50	14.00	13.50	12.50
54 15 x 36 to 24 x 30.....		16.50	15.00	14.50	.....
60 26 x 28 to 24 x 36.....		17.75	16.25	14.75	.....
70 26 x 36 to 26 x 44.....		19.00	17.50	15.25	.....
80 26 x 46 to 30 x 50.....		21.00	19.50	17.00	.....
84 30 x 52 to 30 x 54.....		22.00	20.25	18.00	.....
90 30 x 56 to 34 x 58.....		23.00	21.25	19.00	.....
94 34 x 58 to 34 x 60.....		24.00	22.75	21.00	.....
100 36 x 60 to 40 x 60.....		26.50	24.50	22.00	.....

United Inches.	Sizes.	Double.			
		AA	A	B	C
		AA	A	B	C
25 6 x 8 to 10 x 15.....		\$13.00	\$12.50	11.00	\$10.00
40 11 x 14 to 16 x 24.....		16.00	15.00	13.50	12.00
50 18 x 22 to 20 x 30.....		20.50	19.50	18.00	.....
54 15 x 36 to 24 x 30.....		22.00	20.75	18.75	.....
60 26 x 28 to 24 x 36.....		25.00	23.00	21.00	.....
70 26 x 36 to 26 x 44.....		26.00	25.00	22.50	.....
80 26 x 46 to 30 x 50.....		28.00	26.50	23.75	.....
84 30 x 52 to 30 x 54.....		30.00	28.00	25.25	.....
90 30 x 56 to 34 x 58.....		31.00	30.00	27.00	.....
94 34 x 58 to 34 x 60.....		32.50	31.00	28.00	.....
100 36 x 60 to 40 x 60.....		36.00	33.50	30.00	.....

Sizes above \$10 per box extra for every 5 inches. Discount—80% 5%, single strength; 30% 10% 5% double strength.

Here in Mexico, says the *Financier*, we have seen a steady improvement in business for over a year, and, indeed, it may truthfully be said that the exterior and interior trade of Mexico is now in a very satisfactory condition. For this happy state of things the country is largely indebted to the peaceful and progressive policy of the Diaz administration, to its strenuous maintenance of the national credit in the face of appalling difficulties, and to its firm suppression of civil disorder at home. Four years ago the country was practically bankrupt; the nation, despite its magnificent endowment of natural riches, was so poor that it had credit neither at home nor abroad.

The rapid increase in the export movement of American goods over the Canadian Pacific Railroad is shown by the statement in a report of the Bureau of Statistics to the effect that exports from the United States by this route during the last six months of 1888 were greater by 90 per cent. than during the first six months, and were nearly 50 per cent. of the total for 18 months. During the last half of the year more than 5,000,000 pounds of merchandise found this outlet to foreign countries, more than 80 per cent. of the total being of cottons.

## Remarkable Decline in Population.

The latest statement of the population of Ireland by the Registrar-General is 4,777,555. This estimate is undoubtedly about as accurate as a census, and it indicates a decrease of nearly 400,000 since 1881, when the last enumeration was made. Heavy as the emigration from Ireland has been in the last eight years, it by no means accounts for such a shrinkage, if considered merely in regard to numbers and the nature of the emigration is not taken into account. What produces such an effect is the fact that the vast majority of the emigrants are young and vigorous, leaving the infirm and the aged behind to constitute an abnormal proportion of the population of Ireland. In this way it has come to pass that the fecundity for which the people of Ireland were long famous has largely vanished, except in so far as it is preserved among the Irish in other parts of the world. The density of population in Ireland, which was very remarkable in 1841, when the island had 8,295,061 inhabitants, is no longer extreme in any sense. Belgium has a much greater population on one-third of the area, and even the State of Massachusetts, with naturally inferior soil, has nearly twice as dense a population. In ten years more, at the rate things are going now, Ohio will have as many people as Ireland, and nearly as many in proportion to its area. These facts are a remarkable proof of the decline of a country of Western Europe possessing many natural advantages, and they go far toward justifying the demand for a radical change of some sort in the government of the island.

The city of Providence, R. I., has just contracted for 800 electric lamps at a cost of 44 cents per lamp per night, the contract to run for three years. This is the cheapest rate any city has yet obtained, with the exception of St. Paul, Minn., where the cost is 41 cents per lamp per night, and New York, where the cost is 40 cents. Philadelphia pays 47 cents, a number of cities from 50 to 60 cents, while Boston pays 65, and Sacramento, Cal., touches the limit at 69 cents.

A Washington dispatch says it is probable that the monitor *Puritan*, which for years has been a monitor only in name, never having been supplied with turrets or guns, will soon be transformed into an armored vessel of modern type and of great power. To allow for increased weight of ordnance it is proposed to reduce the thickness of the armor belt considerably below the water-line, while slightly increasing its thickness above, and to dispense with two boilers.

The Hamburg-American Steam Packet Company have contracted for two more twin-screw express steamers, one to be built by the Vulcan Shipbuilding Company at Stettin, Prussia, which constructed the *Augusta Victoria*, and the other by John Elder & Co., at Fairfield, the builders of the *Etruria* and *Umbria*. The new vessels will be 520 feet long, 57½ feet broad and 41 feet deep, and in every other respect will be like the *Augusta Victoria* and her sister steamer, the *Columbia*.

It is said that the State of Georgia alone has 55 cotton mills, and that the city of Augusta contains 13 cotton manufacturing plants, which represent \$5,500,000 of capital. It is the opinion of the *Manufacturers' Record* that the present year will be the greatest thus far in the development of the industries of the South.

## Hardware.

There is only a moderate movement in trade, and purchases are for the most part limited to small lots to complete assortments or meet immediate wants. While few changes in prices are reported, the tone of the market is not strong, and manufacturers are desirous of securing orders, and in some cases are making inducements in the way of slight concessions in prices, better freight allowances, &c.

### Barb Wire.

The demand continues fair, and a good volume of business is doing without specially new features. Prices in this market are well maintained on the basis of 3.5 cents for carload lots, delivered, but the effect of the Western prices is felt to a certain extent.

### Cut Nails.

A fair trade is in progress, but the market can by no means be called active. Wire Nails are competing vigorously with Cut Nails in this locality and are securing an increasing proportion of the business. Yet a tendency to harden is asserted by dealers to be perceptible in Cut Nails, and they are of the opinion that bottom has been touched. The restriction of production recently made is probably accomplishing this result. Four of the five largest factories in the Atlantic States Nail Association have been shut down, and several of the smaller concerns are also idle. This will cut down the supply of Cut Nails very considerably, as the warehouses are understood to be lightly stocked. Iron Nails are quoted at \$1.80 @ \$1.90 in carload lots on dock.

A special meeting of the Western Cut-Nail Manufacturers' Association was held in Wheeling, W. Va., on the afternoon of the 23d inst., for the purpose of taking action on the notice given by the La Belle Iron Works last month of its intended withdrawal from the organization unless certain modifications in the existing arrangement and restrictions were conceded. The La Belle concern has been a large seller of Nails since the organization of the association, and each month has had to pay 10 cents per keg for every keg of Nails sold in excess of its allotment. The officials of the concern became dissatisfied with this arrangement and gave notice of their intended withdrawal. As before stated, the object of the meeting was to take action in the matter, and after a lengthy session it was finally decided that the 10 cents per keg feature of the agreement would be abandoned in the future. Each mill can now market its production without any restrictions whatever. This action means that the association has practically been dissolved.

### Wire Nails.

Representatives of most of the largest manufacturers of Wire Nails met in Cleveland, Ohio, May 23, about 90 per cent of the capacity of the country being represented. This meeting was called for the purpose of considering the advisability of adopting a new card which would meet some of the difficulties which have been experienced in the use of the present one and the list for Miscellaneous Wire Nails. A revised card was accordingly submitted, which, after consideration and some slight modifications, was unanimously adopted by the manufacturers present to go into effect June 1. In the new card the price of 60d Common is made the base, the smaller sizes of the different Nails having extras according to the increased cost of manufacture. This is to permit Nails being sold on a certain base price without regard to the assortment,

and thus remove the necessity for the manufacturer insisting in taking an order on an average advance of from 40 to 50 cents, as has heretofore been the case. It is also claimed that at the base price, which has for some time been ruling, a large part of the output was sold under cost, the manufacturers endeavoring to come out even by the large advances on the smaller Nails. In the new list accordingly the extras on the larger Nails are advanced, while on the smaller Nails they are reduced. The manufacturers also propose a new departure in making the card cover shelf goods, and doing away altogether with the miscellaneous list subject to discount.

In the part of the card relating to shelf goods, extras are given for 100 pounds in 1-pound papers, with deductions for the goods in bulk in 25 and 50 pound boxes, and also in 100-pound kegs, with additions also for  $\frac{1}{4}$  and  $\frac{1}{2}$  pound packages. This change is made for the purpose of simplifying matters and avoiding the confusion which has been found difficult to regulate, as between goods purchased by the card and from the list with discount.

### Sheet and Bolt Copper.

The Association of Copper Manufacturers of the United States adopted May 23 new prices on Sheet and Bolt Copper, &c. In these prices a reduction is made of 5 cents per pound, which makes the present list the same as the one in force during the fall of 1887. This action has been anticipated on account of the decline in the price of raw material. The new prices are as follows:

Cold or Hard-Rolled Copper lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

### TINNING.

Tinning sheets on one side, 10, 12 and 14 x 48, each..... 8¢  
Tinning sheets on one side, 30 x 60, each... 30¢  
For tinning boiler sizes, 9 inches, 14 x 60, each..... 15¢  
For tinning boiler sizes, 8 inches, 14 x 56, each..... 12¢  
For tinning boiler sizes, 7 inches, 14 x 52, each..... 12¢  
Tinning sheets on one side, other sizes, per square foot..... 2½¢  
For tinning both sides, double the above prices.

A revised list on Seamless Brass Tubing has also been adopted, bearing date May 15. The lists were not, however, sent out to the trade until last week.

### Miscellaneous Prices.

The market for Tin-ware, Pieced and Stamped, is not in a very satisfactory condition, and there is considerable diversity in the prices made by the different manufacturers. A large business is being done by the manufacturers direct with the retail trade, and in several sections there appears to be an increase in such trade, the prices given to the small buyers being nearer those given the jobbers than was formerly the case. Pieced Tin-ware is being sold largely at net prices, and the same remark applies to a considerable extent to Stamped-Ware. The list of the Central Stamping Company is the one in general use, and this is subject to a discount of from 75 per cent. to 75 and 10 per cent.

There is some irregularity in the market for Wrought-Iron Pipe, but the volume of business is good, and it is expected that it

Sizes of sheets.		64 oz. and over.	52 oz. and up to 64 oz.	40 oz. and up to 52 oz.	32 oz. and up to 40 oz.	24 oz. and up to 32 oz.	16 oz. and up to 24 oz.	8 oz. and up to 16 oz.	Lighter than 8 oz.
		Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.
Not wider than 30 in.	not longer than 72 in.	20	20	20	21	22	23	26	28
	longer than 72 in.	20	20	20	21	23	25	29	
Wider than 30 in. but not wider than 36 in.	not longer than 96 in.	20	20	20	22	24	28	31	
	longer than 96 in.	20	20	21	23	25	29	33	
Wider than 36 in. but not wider than 48 in.	not longer than 96 in.	20	20	22	24	26	30		
	longer than 96 in.	20	20	23	25	27	31		
Wider than 48 in. but not wider than 60 in.	not longer than 96 in.	20	20	25	27	32			
	longer than 96 in.	20	21	26					
Wider than 60 in. but not wider than 84 in.	not longer than 96 in.	21	22						
	longer than 96 in.	22	23						

All Bath-Tub Sheets, per pound, 16-ounce, 23 cents; 14-ounce, 25 cents; 12-ounce, 27 cents; 10-ounce, 30 cents.

Bolt Copper,  $\frac{3}{4}$  inch diameter and over, per pound, 20 cents.

Circles, 60 inches diameter and less, 3 cents per pound advance over the lowest prices of Sheet Copper of the same thickness.

Circles over 60 inches diameter up to 96 inches diameter, inclusive, 5 cents per pound advance over the lowest prices of Sheet Copper of the same thickness.

Circles over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard-Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

will so continue through the season. It is not expected that prices will rule high, as the capacity of the mills is in excess of the regular demand.

Bean's Compact Home, which is put on the market by E. D. Bean, 147 Washington street, Boston, Mass., and described on page 830, is made in two styles, plain and fancy, the former being sold at \$35 and the latter at \$50, both of these prices being subject to a discount of 25 per cent.

The market for Manilla Rope gives some evidence of weakness and prices are a shade lower.

A large quantity of Lawn-Mowers has been sold during the season, but at dis-



counts representing a wide range of prices. The standard machines have been held more firmly than some of the newer makes, on which some low quotations have been made.

In the description which was given in our last issue of Greely's Cork Extractor the address of the manufacturer was inadvertently omitted. These goods are put on the market by B. J. Greely, 715 Washington street, Boston, and are made in the following sizes and styles and sold at the prices named. It will thus be seen that a sufficient variety is offered to meet the demands of the trade.

No.	Price per gross.
1, Small, Wire.....	\$2.00
2, Medium, Wire.....	2.00
3, Medium, Bessemer Steel Enamel Handle.....	8.00
4, Large, Bessemer Steel Enamel Handle..	9.00
5, Medium, Bessemer Steel Mahogany Handle.....	10.50
6, Medium, Fine Imported Steel.....	13.50
7, Large, Fine Imported Steel.....	15.00
8, Medium, Folding.....	18.00

The following revised quotations are made on the tools made by the W. G. Avery Mfg. Company, Cleveland, Ohio:

	Discount.
Sawset and Punch.....	50 %
Revolving Punch.....	40 %
Flush Bevel Squares.....	40 %
Flush Bevel Protractors.....	50 %

#### Items.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., have issued a 24-page price-current, referring principally to seasonable goods, of which a varied line is represented, including Lawn-Mowers, Scythes, Spring Hinges, Refrigerators, Ice-Cream Freezers and Ice Tools, with many other specialties. Tin-Plate and Caldwell's patent Steel Roofing are also given a prominent place.

The following circular, issued to the trade under date May 16, is the formal announcement of the consolidation in question to which we referred in our last issue:

Having caused the stocks of Hardware of Kellogg, Johnson & Bliss, Incorporated, and of Bullard & Gormley to be consolidated, and having assumed the management of the corporation of Kellogg, Johnson & Bliss, we shall in future continue the business of both concerns under the franchise of the corporation, at 109-110 Randolph street, Chicago, but without change in our former business policy. We desire to thank our friends for past favors, and to assure the customers of both concerns that we expect with our enlarged facilities to merit a continuance of their patronage.

GEORGE E. BLISS,  
CHAS. W. BULLARD, } Managers  
JAMES H. GORMLEY,

The Francis T. Witte Hardware Company, 106 Chambers street, New York, are putting on the market an Ice-Making Machine of German manufacture for which they are agents. It is made in sizes for producing from  $\frac{1}{4}$  pound to 18 pounds of ice in the regular machines.

Landers, Frary & Clark, manufacturers of Cutlery and Hardware Specialties at New Britain, Conn., have opened a sample-room at No. 72 Lake street, Chicago, and placed it in charge of R. K. Hitchens, who has represented them as traveling salesman in the States of Iowa, Illinois, Wisconsin and Minnesota during the past nine years. They will carry a full sample line of Table Cutlery and Carvers in buckhorn, ivory, pearl and celluloid handles, and Case Goods. It is their intention to sell the wholesale and retail trade in Chicago, but will sell only to the jobbing trade outside of that city. J. M. Pool, of Clinton, Iowa, is representing the firm in the territory where Mr. Hitchens has been so well and favorably known.

Cordley & Hayes, 173 and 175 Duane street, New York, issue a circular relating to their Fire-Pails of indurated fiber, and

showing their adaptation for this use and superiority over the common goods. They also illustrate their Indurated Fiber Fire-Extinguisher, of which a description is given on another page.

In addition to the houses mentioned in our last issue as represented by Alfred Ely, Baltimore, Md., the Standard Tool Company, of Cleveland, Ohio, may also be mentioned, for whom he is agent for the sale of their Twist Drills and other specialties.

McIntosh, Huntington & Co., Cleveland, Ohio, send out a budget containing a large number of new pages for their catalogue, which are gummed for insertion in the proper places. They allude to a large variety of specialties and standard goods which they have added to their line. Among these may be mentioned the Wrought-Steel Mortise Door Locks and Latches of the Russell & Erwin Mfg. Company, Gate City Water Coolers and Filters, and others. Several of the pages relate also to revised price-lists, among which are the new lists on Screws and Granite Iron-Ware. The Screw list is also printed separately on a card for use in the store or office.

W. E. Lewis, Corry, Pa., issues circulars describing Electrical Apparatus, including Le Clanche Battery and Battery Supplies, Giant Sounder, Pony Relay, Key Perfection Telegraph Sounder and a set including vibrating Electric Bell, Wood Push-Button, Le Clanche Battery, 75 feet of Insulated Wire, Screws and Staples, this set being sold at \$1.50, subject to a discount of 10 per cent. to the trade. The Le Clanche Battery, Crow-Foot form, 5 x 7, is sold at 85 cents, and 6 x 8, \$1, subject to a discount of 10 per cent.

H. A. Knox & Co., Houndsditch, London, England, issue an exceptionally interesting catalogue of 'Cycle Accessories, showing the line of these good which they are putting on the market the present year. It represents a very complete assortment of Lamps, Saddles, Bags of many different patterns, Tool-Bags, Bells, Wrenches, Ball Pedals, Bearings, &c., Locks and Chains, Oil-Cans, Whistles and Tools for the 'Cycle trade. This catalogue is issued in two forms, which are precisely the same, except the prices, one giving net trade prices, and the other, intended for the use of their customers, giving retail prices. This feature is deserving attention from manufacturers and merchants. The extent of the line shown in the catalogue under review is indicated in the fact that it contains 434 illustrations.

The announcement in our last issue of the retirement from the John Russell Company of R. N. Oakman, Jr., and the purchase of his interest by W. P. Dustin, was received by the trade with much interest, who regarded it as an important change in a leading and successful company. Mr. Oakman is regarded as having been influential in bringing the affairs of this establishment into excellent shape, and so managing matters as to give the company their present prosperity and position, and also contributing much to the understanding which exists among the other manufacturers in this line. The part in this development which was taken by Mr. Dustin is also recognized, and it is conceded that while he was not as prominent in the direction of affairs his wisdom, energy and tact had much to do in accomplishing the result achieved, and it is anticipated that under his direction there will be a continuance of the same policy which has lately been pursued and the maintenance of the position attained by the company. Referring to his qualifications, a recent issue of the Turner's Falls Reporter says:

Mr. Dustin was brought up from youth in the Cutlery business as a salesman for one of the leading houses in the State and traveled

the country over time and again, had a personal acquaintance of untold value, had studied the needs and necessities of every section of the country, even to the peculiarities of sections of individual States, and in early manhood stood at the head of a class of business men possessed of indomitable perseverance coupled with rare intelligence and foresight. A magnificent physique, with perfect health, he was simply a marvel of energy and endurance and a happy disposition that made friends at every turn, success could not be avoided, and he was always forehanded financially as well for himself as for others, and Mr. Oakman's native shrewdness soon discovered the need of such a man in placing the institution in the forefront of the manufacturing industries of the country, and thenceforth the product of the mill was marketed by Mr. Dustin, and with such a master hand in control of the life-giving spring, the old established institution made such strides as it never knew before. Mr. Oakman and Mr. Dustin were a strong team together, but ill-health made a division necessary, and Mr. Oakman retires with the respect and confidence of all his associates, and Mr. Dustin takes on additional burdens of care, with large investments of stock, with the ease born of confidence in his ability to command success in any undertaking in which he might engage. A man who has from boyhood traveled in one straight track, and that leading to honor and success, in whom the most unlimited confidence is bestowed by all classes, whose methods are methodical to a degree bordering on the marvelous, a democratic man whose only distinctions of caste are right and wrong, Mr. Dustin will assume the management of this great corporation with the hearty sympathy of the entire village, who never cease admiring his manly ways, and the associate stockholders, who feel that their investments cannot be otherwise than safe in his hands.

Baker & Hamilton, San Francisco and Sacramento, Cal., who have for a number of years been represented in this city by Charles D. Graham, 88 Wall street, have issued a catalogue of 1008 pages, which gives evidence of careful compilation, as well as of the extent of the manufactures and trade of the house. The volume opens with illustrations of their San Francisco stores, Market, Pine and Davis streets, and of their Sacramento stores and the Benicia Agricultural Works. After the index, which is clearly printed with black-faced letters for the principal classes of goods, 200 pages are devoted to Wagons, Agricultural Implements, Machinery, &c., many of which are of their own manufacture, including a variety of Wagons, Hand and Road Carts, Buckboards, Mowers, Benicia Headers, Barley Crushers, Plows, Cultivators, Harrows, &c., an important line made in their Benicia factory. The Hardware department is prefaced by a circular to the trade, and opens with an extensive assortment of Tools, in which Disston's Saws are given the first place, followed by a large variety of other Tools, after which come Handles, Steel Goods, Rakes, Forges, Nails and an extensive line of Builders' Hardware. Then comes an assortment of miscellaneous goods, including Cutlery, Guns, Ammunition, &c. The volume closes with tables giving information in regard to Cabinet Locks and Padlocks, of which comparative lists are given, and tables of the weight of Iron, number of Nuts, Washers, &c., to the pound, and other matters of interest. The volume, which is creditably printed and well bound, is a specimen of the work of J. R. Brodie & Co., San Francisco, and illustrates the important position occupied by the house issuing it and the enterprise with which they are still pushing their business.

Announcement is made by Wm. A. Ives & Co., Hamden, Conn., that they have disposed of their factories and plant to the Hamden Mfg. Company, of the same place, who will continue the manufacture of their well-known line of goods. The supervision of the mechanical department will not be changed.

The New York School Book Clearing House, 65 Duane street, New York, are contemplating a new enterprise with a special relation to Hardware. With the

space at their command they advise us that they can provide a satisfactory sample-room where traveling salesmen can show their goods. The convenience of the location, its proximity to the center of the Hardware trade and the pleasant accommodations they can furnish are mentioned.

Hamilton & Mathews, Rochester, N. Y., issue a circular of the Rival Apple Parer, Corer and Slicer, manufactured by Kelsea & Co., Antrim, N. H., for whom they are general agents. This machine, it will be remembered, was put on the market last year, when an illustrated description of it was given in these columns. The circular in hand illustrates the machine and gives a full description, pointing out the features of its construction and its advantages, with testimonials from the parties who have used it. The experience of last season is referred to as indicating that the Parer is exceptionally satisfactory and an excellent trade is anticipated. The moderate price at which it is offered is one of the points made in regard to it. Last season all the machines were made to pare, core and slice with four turns of the crank, and this is referred to as being in general the best construction, but as some desire a Parer which will do its work with three turns of the crank, they have made one in which this is accomplished, which they designate their Rival No. 2. It is the same as the other excepting the crank gear and the fork-shaft gear.

#### Trade Topics.

The Legislature of Iowa, as is well known, established a tariff for freight, in order to protect shippers, which, when the railroads endeavored to have an injunction served against its operation, was sustained by the courts. In this condition of things the railroads are reported to be making it as unpleasant for shippers as possible, subjecting them to annoyance and inconvenience, and it is also intimated that they have withdrawn a portion of their passenger service and are changing their time-tables frequently. As an example of the annoyance caused in shipping goods it is mentioned that in a shipment of Wheelbarrows, K. D., the wheels were taken off and billed separately at a higher rate, making the freight on each Barrow more than the profit which would result to the retailer in its sale. The railroads, by this policy, hope so to disgust the public that the freight rates will be left with them entirely.

From the same State we have the following report in regard to the condition of business, with reference also to other matters of trade interest:

We find all, both jobbers and retailers, are complaining of dullness in business. March and April were both busier months than May has been. Low values on goods seem to be the ruling state of affairs, and buyers are reluctant to enlarge their stocks by additional purchases. The prospect for crops of all kinds is very encouraging throughout the State, and a good business is anticipated in the fall.

The majority of the Hardware stores through Iowa are nicely arranged, and rather ahead, if anything, of the towns where they are located. Wood boxes sampled with shelf-ware usually occupy one side of the store, while Tin-Ware and House Furnishings are on the other side. The proprietors as a rule are young, energetic men.

Almost every town of over 3000 inhabitants has one or more stores that job goods to the small surrounding towns, the Interstate Commerce law making this possible in the way of freights to these small jobbers. Traveling men are very numerous in all lines, every train bringing more or less of them, and the query is often made, How do they all live?

In connection with the sale of goods to Canadian purchasers, which are illegally diverted from their intended channel and given a market in this country, we have received information in regard to an amusing instance in which the scheme

failed to accomplish its desired purpose and resulted in a loss instead of a gain by the American recipients of the goods. In this instance the goods purchased by the Canadian firm were controlled by a combination, so far as the dealers in the United States were concerned, and were sold to the Canadian house at some 10 per cent. under the combination price. They were then sold to a leading house in the West, but before they had received the goods the combination referred to had broken, and the goods, therefore, cost the jobber fully 5 per cent. more than if they had been purchased direct from the manufacturer.

A correspondent writes as follows with reference to an objectionable practice which in his experience has been resorted to by more than one manufacturer:

For a long time it has been the custom of some manufacturers when they know there is to be a decline in their goods to send their agents over the country and persuade the dealers that there is a probability of an advance in prices. This, of course, has a tendency to make retailers purchase, and frequently largely in advance of their wants, only to find in a short time there is a decline, instead of an advance. Instead of trying to help the trade who distribute their goods they have very frequently done them an injury. I do not say all manufacturers do this, but still the practice is not uncommon.

#### Referred to the Trade.

From a Hardware house in Alabama who are placing a new stock of goods on their shelves and desire in the arrangement of their store to follow the most approved methods we have an inquiry in regard to the proper place on the boxes to mark cost, selling price, &c., whether on the front, side or bottom. We shall be glad to have replies to this inquiry from the trade.

#### Export Business.

Ex-Consul Porch is referred to as speaking as follows in regard to American trade with Mexico and the apparent lack of enterprise and push on the part of manufacturers in introducing their goods:

American Iron and Steel manufacturers are not aggressive enough to capture the trade of other countries. A large amount of our Iron and Steel Manufactures could be sold abroad if their merits were only published to the world. American Saws are in the Hardware stores at Birmingham, England, and so with many other special articles of American make. They can compete with the world. Of course there is no denying that the existing tariff arrangements hamper this competition, but foreigners will still buy many of our products when they are once convinced of their worth. I know of no manufacturers who are really pushing with any energy their goods into markets beyond our own boundaries. The Britisher has his representatives in Mexico, in Japan, in South America, in the Indies, and forces his goods on the attention of the consumer. This is what our representative men must do. He who is first in the field will reap the benefits. Mexico offers a particularly favorable field for the operations of our manufacturers. There is a wide sale for Hardware particularly. The Germans now principally control this business, and the Hatchets and other edge tools which they offer are worthless as pewter. In my mind it would be an excellent thing for manufacturers of this country to club together and establish an American Iron and Steel Goods emporium in Mexico, where our manufactures could be exhibited for sale, not with the idea of making money at first, but in the hope of rich returns in the not distant future. We may feel that the higher price of labor in this country puts us at a disadvantage, but let us be as energetic and aggressive as our competitors, and the market for American-made articles will be expanded immensely.

From a recent financial report from Adelaide we have a description of things in South Australia which refers to abundant rains as giving exceptional promise of large crops. It is added in regard to the business situation:

The wheat market locally has been very dull, shipments to the United Kingdom have virtually ceased, and what we have to spare will be required for the consumption of the eastern colonies, and for our usual customers

in the East Indies and the Cape Colonies. The quotation at Port Adelaide is quietly steady at 5/ to 5/1 for shipping parcels; in Melbourne quotations have advanced to 5/8 per bushel. Until the aspect of the coming harvest in the Northern Hemisphere is more definite there seems little chance of any serious fall in prices here. The fine rains we have been favored with have exercised a marked effect in restoring confidence in every department of our community, and there are many signs of returning prosperity—steady increase in the savings bank deposits, gradual improvement in retail trade and the tenantry of small tenements long untenanted. The community has learnt a lesson of provident economy; expenses of all kinds have been cut down, and the lesson of self-help been effected by the majority of households. There is abundance of capital for investment, and though there are more securities offering, caution is the first care of capitalists or their representatives.

The last issue of the *Ironmonger* which has reached us refers to the lack of statistics relating to the British Nail trade similar to those which are issued in this country by the American Iron and Steel Association. In the absence of such statistics they are able only to conjecture what their annual output of Nails may be, but it is intimated that the English manufacturers in this line are not doing as much as they ought to be doing, and this point is enforced by complaints which have been received by them from South Africa and elsewhere as to the replacement of British-made Nails by those of American brands. Referring to the position of Nails in this country the *Ironmonger* adds:

In the United States the Nail trade is certainly an important industry, seeing that of Cut Nails alone (not including railroad or other Spikes made from bar iron, Wire Nails of any size, or machine-made Horseshoe Nails) the aggregate production in 1888 amounted to 6,493,591 kegs of 100 pounds each, or equal to very nearly 200,000 tons. This large production was much smaller than that of 1886, but was owing to the increased competition of Wire Nails, of which last year the output was 1,500,000 kegs, or nearly 67,000 tons. Of the Cut Nails 2,170,107 kegs were of iron and 4,323,484 kegs of steel, thus showing that last year the steel Nails counted two-thirds of the total production, whereas in 1884 steel was used for only 5 per cent. of the total. Of iron and steel combined about 218,000 kegs were made in the States last year, almost the whole of them being produced in California; but for what purposes they are specially used or preferred is not stated by Mr. Swank. The leading Cut Nail-producing district is that of Wheeling, which covers two counties in West Virginia and two counties in Ohio, all bordering on the Ohio River. The next most important center of the trade is the central part of Pennsylvania, and third on the list (although at one time it was first) is Allegheny County, Pa. It is not shown that the American Wire-Nail works are located in any particular part of the country, but it is stated that 47 of them were in operation in 1887 and probably a greater number last year. The figures we have reproduced are interesting of themselves, but they also serve the purpose of directing the attention of our Nail-makers to the two central facts they illustrate—namely, the overwhelming substitution of steel for iron in respect of Cut Nails, and the steady displacement of Cut Nails by Wire Nails. In saying this we are well aware of the greatly extended use of steel for Cut Nails in Great Britain, but we are not so sure that Wire Nails have received or are receiving the amount of attention which is being bestowed upon them in Germany and Belgium, as well as in the States.

#### Exports.

PER BARK NANNY, MAY 13, 1889, 10B  
DUNEDIN, NEW ZEALAND.

By Dunbar, Hobart & Co.—6440 pounds Nails, 9240 pounds Nails.  
By Reed & Barton.—4C3 pounds Plated-Ware.  
By Rogers, Smith & Co.—10 packages Plated-Ware, 1 box Plated-Ware.  
By Manning, Maxwell & Moore.—388 pounds Rail Saws, 36 pounds Iron Levers.  
By Fairbanks & Co.—1470 pounds Scales.  
By Coombs, Crosby & Eddy.—36 dozen Hardware, 1040 Rubber Tubes.  
By A. S. Lascelles & Co.—1 case Handles, 1 gross Razor Straps.  
By R. W. Cameron & Co.—4 boxes Machinery, 1 box Dairy Goods, 1 box Dairy Goods.  
By W. K. Freeman.—2½ gross Axle Grease, 1120 pounds Axle Grease, 4 cases Hardware, 684 pounds Wringers, 6 cases Hardware, 8 cases Scales, 22 Lawn Mowers, 3016 pounds Axles, 261 pounds Hardware, 22½ pounds Handles, 1069 pounds Horse Nails.

By *W. H. Crossman & Bro.*— $\frac{1}{2}$  dozen Mangles, 2 dozen Apple Parers, 5 boxes Hardware, 4 dozen Hatchets, 3050 pounds Horse Nails, 18 dozen Handles, 1 box Hardware, 13,536 pounds Barb Wire, 12,286 pounds Barb Wire, 22,420 pounds Barb Wire.

By *Mailler & Quereau.*—50 boxes Clothes Pins, 200 boxes Clothes Pins, 22,375 pounds Barb Wire, 2 cases Cultivators, 7 cases Axes, 31 packages Reapers.

By *Arkell & Douglas.*—29 packages Dairy Goods, 6 crates Ranges, 1 dozen Wrenches, 12 dozen Brushes, 1 case Snaps, 1 case Whips, 1 box Hardware, 12 cases Axle Grease, 4 bundles Blacking, 1 case Hardware, 10 cases and 10 kegs Axle Grease, 3 cases Nails, 1 case Hardware, 14 cases Nails, 2 cases Saws, 1 case Hardware,  $\frac{1}{2}$  dozen Wringers, 2 cases Hardware.

By *Charles Brewer & Co.*—1 case Hardware, 6 cases Agricultural Implements, 10 cases Hardware, 9 cases and 1 bundle Hardies, 7 cases Horse Nails, 2 cases Tools, 1 case Stone, 20 bundles Washboards, 20 cases Agricultural Implements, 13 cases Nails, 6 cases Horse Nails, 2 crates Handles.

By *Strong & Trowbridge.*—1 case Spade Handles, 1 case Tacks, 1 case Spade Handles, 2 cases Wringers, 1 case Pumps, 14 cases Lawn Mowers, 2 cases Axle Handles, 2 cases Shade Rollers, 6 cases Scales, 1 case Forks, 20 cases Axes, 3 cases Castings, 1 case Hoes, 1 case Mangles, 10 cases Carpenters' Tools, 1 case Pumps, 1 case Locks, 1 case Toys, 2 cases Glue, 1 case Ice Cream Freezers, 1 case Rakes, 19 packages Lawn Mowers, 28 packages Stoves and Fire Brick, 1 case Rubber Goods, 2 cases Hardware, 3 cases Tools, 12 bundles Washboards, 1 case Rubber Hose, 1 bale Rubber Hose, 1 box Whetstones, 1 box Bolts, 1 case Wrenches, 1 case Screw-Drivers, 6 crates Churns.

PER SHIP MONROVIA, MAY 15, 1889, FOR MELBOURNE, AUSTRALIA.

By *Healy & Earl.*—2 cases Sand-Paper, 1 box Bolts, 1 Trip Hammer, 2 Iron Safes, 20 cases Wood-working Machinery, 4 crates Road-Scrapers.

By *L. Gershel & Bro.*—30 Carbines, 20,000 Metallic Cartridges.

By *W. K. Freeman.*—2450 pounds Lawn Mowers, 39 cases Handles, 20 dozen Forks, 47 dozen Handles, 16 $\frac{1}{2}$  gross Axle Grease.

By *W. James.*—77 Boxes Lawn Mowers.

By *Frank H. Idione.*—1 case Plows, 6 cases Springs.

By *McLean Bros. & Rigg.*—39 dozen Saws, 4 dozen Miter-Boxes, 1 $\frac{1}{2}$  dozen Boring-Machines, 8 dozen Gate-Latches, 130 dozen Axle Grease, 6 dozen Bench Screws, 1 dozen Sad Irons, 4 cases Agate-Ware.

By *H. W. Peabody & Co.*—8 cases Velocipedes, 12 cases Firearms, 12 cases Shovels, 8 cases Shovels, 50 bundles Washboards, 2000 pounds Nails.

By *Coombs, Crosby & Eddy.*—24 dozen Axle Handles, 22,870 pounds Sheet-Iron, 6 gross Traps, 474 dozen Carpenters' Tools, 72 dozen Thermometers, 25 dozen Padlocks, 150 dozen Traps, 50 dozen Traps, 200 dozen Hardware, 6 dozen Carpenters' Tools, 125 dozen Whip Stocks, 25 dozen Hardware, 50 dozen Strainers, 12 gross Glass Cutters, 76 dozen Thermometers, 72 dozen Carpenters' Tools.

By *A. Field & Co.*—6 dozen Blacking, 11 dozen Harness Tools, 6 dozen Harness-Ware, 3 gross Whips, 12 dozen Harness-Ware, 18 dozen Harness Dressing, 4 dozen Harness-Ware, 36 dozen Whips, 6 Saddles, 6 dozen Harness, 4 dozen Harness, 2 $\frac{1}{2}$  gross Harness-Ware, 2 gross 8 dozen Hardware, 27 Axes, 790 pounds Hardware, 50,000 Bolts, 170 sets Axes, 1700 pounds Hardware, 21 dozen Hardware, 3000 Hardware, 6 $\frac{1}{2}$  dozen Hardware, 31,000 Hardware.

By *Strong & Trowbridge.*—6 cases Whetstones, 16 cases Carpenters' Tools, 8 packages Grindstone Parts, 4 cases Carpenters' Tools, 1 case 1 bundle Whips, 2 cases Castings, 1 case Shovels, 5 cases Wringers, 2 cases Castings, 1 case Forks, 3 cases Locks, 7 cases Tools, 1 case Hardware, 50 kegs Nails, 1 case Pumps, 2 cases Pumps, 1 case Lamp-Ware, 1 case Hardware.

By *R. W. Cameron & Co.*—16 cases Pulleys, 1 case Bushings, 50 boxes Handles, 1 case Whips, 9 cases Velocipedes, 5 cases Hardware, 4 cases Whips, 2 cases Plated-Ware, 2 cases Hardware, 4 cases Wire-Work, 2 crates Blacking.

By *W. H. Crossman & Bro.*—7 cases Hardware, 18 cases Lamp Goods, 108 dozen Shovels, 1 dozen Scales, 4 dozen Tills, 12 dozen Latches, 9 cases Hardware, 2 packages Lamp Goods, 3 dozen Injectors, 8 dozen Pumps, 3 dozen Saw-Sets, 3 cases Hardware, 1 case Hardware, 6 dozen Lawn Sprinklers, 32 dozen Hoes, 24 Hand Spikes, 1 case Hammers, 28 dozen Wrenches, 3 dozen Trowels, 100 dozen Tacks, 24 dozen Hammers, 10 cases Hardware, 1 case Stocks and Dies, 1 package Chucks, 60 dozen Oilers, 1 case Carpenters' Tools, 17 crates Refrigerators, 19 dozen Axes, 1 $\frac{1}{2}$  dozen Ice-Cream Freezers, 250 boxes

Clothes-Pins, 1 gross Graters, 30 dozen Axes, 3 dozen Tills, 6 cases Hardware, 28 dozen Traps, 9 dozen Brushes, 3 cases Hardware.

By *R. W. Forbes & Son.*—23 packages Carriage Hardware, 4007 Bolts, 32 cases Sewing-machines, 2 packages Stamped-Ware, 1 case Rat-Traps, 1 case Fire-Arms, 1 dozen Hay-Knives, 22 packages Oil Stoves, 2 packages Carpet Sweepers, 17 packages Lawn Mowers, 9 dozen Oilers, 3 packages Lawn Mowers, 1 case Brass Goods, 3 packages Hardware, 1 box Pumps, 1200 Nails, 11 boxes Tools, 7 dozen Locks, 1 case Oil-Stones, 22 boxes Lawn Mowers, 55 boxes Lawn Mowers, 1 crate Lawn Pumps, 300 Handles, 1 package Sprinklers, 12 dozen Mattocks, 8000 Primers, 1 case Lamp-Ware, 16,000 Cartridges, 4 gross Sewing-Machine Oil, 1 case Hog-Wringers, 1 case Brass-Ware, 26 dozen Forks, 4 packages Hardware.

By *Winchester Repeating Arms Company.*—50,000 Paper Shells, 10,000 Metallic Cartridges.

By *Simpson, Hall, Miller & Co.*—6 cases Plated-Ware, 9 barrels Glass-Ware.

By *White Sewing Machine Company.*—3948 pounds Sewing-Machines and Parts.

By *Meriden Britannia Company.*—6 packages Plated-Ware, 4 boxes Plated-Ware, 2 boxes Plated-Ware, 8 packages Plated-Ware.

By *Welsh & Lea.*—9 cases Axes, 7 cases Iron Bolts, 4 cases Stone, 2 cases Shovels, 2 cases Hardware.

By *Joseph Dixon Crucible Company.*—2545 pounds Crucibles.

By *Peck, Stow & Wilcox Company.*—32 cases Hardware.

By *Bradley & Hubbard Mfg. Company.*—5 packages Lamp Goods, 59 packages Hardware, 10 cases Hardware, 17 cases Hardware, 40 packages Hardware.

By *Ansonia Clock Company.*—11 boxes Clocks, 34 boxes Clocks, 60 boxes Clocks.

By *Chas. B. Seabury.*—850 pounds Metallic Cartridges.

By *Lazarus & Rosenfeld.*—3 cases Pistols.

By *F. B. Wheeler & Co.*—29 packages Clocks.

By *Crane & McMahon.*—15 cases Spokes, 15 bundles Doubletrees, 2 cases Spokes, 1 case Hubs.

By *Edward Miller & Co.*—13 packages Lamp Goods, 32 packages Lamp Goods.

By *Isley, Doubleday & Co.*—5 reams Sand-paper, 112 pounds Glue, 5 gross Axle Grease.

By *Morris, Strouse & Co.*—9 gross Brooms, 6 gross Shade Rollers, 550 gross Pins, 53 dozen Hatchets, 36 dozen Hammers, 82 pairs Roller Skates, 54 dozen Carpenters' Tools, 36 dozen Iron Tacks, 36 dozen Brooms, 11 gross Sewing-Machine Oil, 46 dozen Mouse-Traps, 5 gross Kitchen Tools, 2 gross Gate Latches, 24 dozen Sad-Iron Stands, 4 dozen Locks, 1 dozen Cork Pullers, 6 dozen Gate Latches.

By *Mailler & Quereau.*—57,328 pieces Roofing Slate, 2 crates Fly-Traps, 30 cases Axes, 10 cases Hardware, 25 cases Axes, 70 cases Axes, 26 cases Axes.

By *Arkell & Douglas.*—21 cases Strops, 3 cases Shade Rollers, 1 case Saw Sets, 1 case Sad-Irons, 15 kegs and 11 cases Nails, 1 case Miter Boxes, 16 cases Hardware, 4 cases Axes, 1 case Washers, 1 barrel Glue, 3 packages Grease, 3 cases Hardware, 9 cases Axes, 4 cases Hardware, 8 cases Carriage-Ware, 5 bundles Rims, 50 cases Wringers, 5 cases Benches, 1 cases Blacking, 27 cases Lawn Mowers, 1 case Carpet Sweepers, 3 cases Tin-Ware, 5 cases Hardware, 8 cases Towel Rollers, 5 cases Wringers, 2 crates Handles, 10 packages Hardware, 8 cases Wringers, 12 dozen Traps, 24 dozen Forks, 4 cases Edge Tools, 3 cases Hardware, 4 cases Hardware, 3 cases Traps, 4 cases Hardware, 2 cases Axes, 4 cases Shovels, 1 case Sand-paper, 17 kegs Nails, 1 case Saws, 1 case Bolts, 6 barrels Glue, 2 cases Hardware.

PER BARK C. H. JAMES, MAY 17, 1889, FOR ADELAIDE, AUSTRALIA.

By *Welsh & Lea.*—2 cases Iron Bolts.

By *R. W. Forbes & Son.*—5 packages Lawn Mowers, 15 gross Bit Snaps, 1 box Hardware, 1 package Hardware, 445 pounds Axle Grease.

By *Walter A. Wood.*—10 Mowers, 10 Reapers, 4 Hay Rakes.

By *Healy & Earl.*—6 cases Reaper Extras, also 1 Pole and 9 Wheels.

By *W. James.*—3 cases Lawn Mowers.

By *Adrianne, Platt & Co.*—18 Reapers, 2 Mowers.

By *T. B. Moore.*—1400 pounds Nails.

By *Ansonia Clock Company.*—23 boxes Clocks, 4 boxes Clocks.

By *Strong & Trowbridge.*—4 bales Rubber Hose, 1 case Wire Goods, 7 packages Lamp Goods, 12 crates Pails, 10 cases Wringers, 2 cases Mangles.

By *Isley, Doubleday & Co.*—6 gross Axle Grease, 560 pounds Axle Grease, 1120 pounds Axle Grease, 7 $\frac{1}{2}$  gross Axle Grease.

By *McLean Bros. & Rigg.*—20 Reapers, 45 Harvesters and Binders and 16 cases Re-

pairs, 1 case Windmills, 1 case Emery Stones, 144 dozen Handles, 4 reams Sandpaper, 6 dozen Forks, 18 gross Handles, 3 dozen Handles, 15 dozen Handles, 1 case Lamp Goods, 3 Drills, 2 dozen Plumbs and Levels, 6 Mangles, 3 gross Door Buttons, 8 dozen Hoes.

By *W. H. Crossman & Bro.*—234 dozen Handles, 20 Meat Choppers, 33 dozen Axes, 24 sets Axes, 3 dozen Hay Forks, 6 dozen Hatchets, 6 dozen Saws, 4 cases Hardware, 10 gross Shade Rollers, 5 gross Polish.

By *Mailler & Quereau.*—41 packages Reapers, 2669 pounds Axes, 1 package Iron Castings.

By *R. W. Cameron & Co.*—4000 pounds Velocipedes, 4500 pounds Refrigerators, 10 cases Axes, 1 case Castings, 24 dozen Axle Handles, 5 gross Clothes Pins, 2 gross Clothes Pins, 5 gross Clothes Pins, 10 dozen Washboards.

By *H. W. Peabody & Co.*—1000 Handles, 2500 Handles, 15 cases Hardware, 6 cases Lamp-ware, 1 case Strops, 1 case Agate-Ware, 3 dozen Wash-Boards, 9 packages Clocks, 11 cases Perambulators, 4 cases Glass-Ware, 40 cases Hardware, 4 cases Lamp-Ware, 42 dozen Taps, 2 cases Stoves, 7 cases Glass-Ware, 2 bales Cordage, 7 cases Agate-Ware, 3 cases Traps, 3 cases Agricultural Implements, 12 packages Wringers, 3 cases Lawn Mowers, 1 $\frac{1}{2}$  gross Grease, 13 cases Fire Arms, 40 dozen Wash-Boards, 130 dozen Handles, 1500 feet Hose, 1 case Barometers, 1 case Sifters, 6 dozen Brooms, 7 rolls Wire Cloth, 49 packages Hardware, 71 packages Carriage-Ware, 50 dozen Handles, 3 crates Fiber-Ware, 9 packages Hardware, 600 feet Belting, 5 cases Wringers, 30 dozen Handles, 1 case Perambulators, 1 barrel Lamp-Ware, 1 case Stoves, 1 case Stamped-Ware, 7 cases Hardware, 1 case Agricultural Implements.

### Arrangement of Stores.

The accompanying illustration, Fig. 341, represents a method of displaying Brushes of all kinds in use by Geo. O. Hart & Son, Paducah, Ky. The racks or shelves for the Brushes are made of tin and are finished with a  $\frac{1}{4}$ -inch bead as shown in Fig. 342, and a steel bar  $\frac{1}{4}$ -inch round is inserted in the bead. The frame-work or

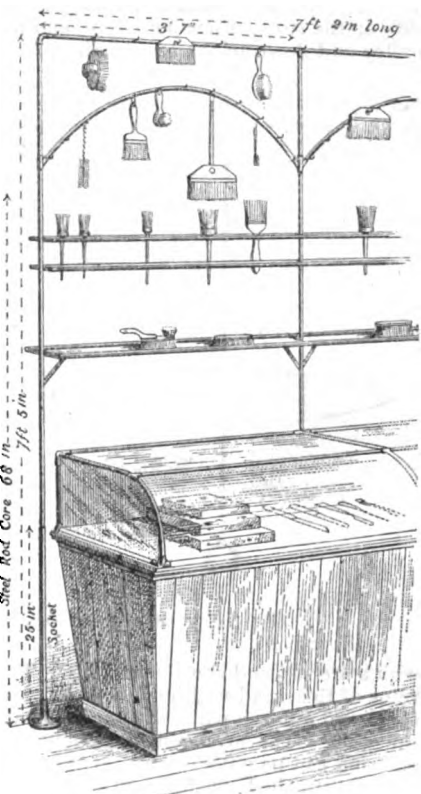


Fig. 341.—Brush Rack.

arches are made of iron which fit in sockets attached to the floor at each end. The first shelf is made of X tin and has a bead turned up on both sides, so that the brushes will not fall off. The upper ones are made in the same way, only they are turned over and have the bead down. In one-half of the shelves there are  $\frac{1}{4}$ -inch holes punched with tinner's punch and in the other half the holes are 1 inch, sizes which are referred to as admitting any

size of Brush handle. The hooks attached to the arches are 2 inches long and made of wire, and are soldered to the top of the arches and to the center of the frame above. The whole is painted black except that the hooks and all the shelf edges are gilded, which gives the rack the appear-



Fig. 342.—Beaded Shelf.

ance of one purchased, and in fact produces an attractive effect, and a very neat and satisfactory display is secured when the rack is filled. Its adaptation to all kinds of Brushes is another point made in its favor. The feet or sockets are made of galvanized iron. Since the rack has been in use in the store of Messrs. Hart & Son they advise us that it has attracted much attention, and they will be glad to give information to any who desire to use it, and thus contribute somewhat to the advancement of Hardware interests in the convenient and attractive display of goods.

We are indebted to J. R. Gallinger, of Osakis, Minn., for a description of the method of displaying bird cages in his store. He employs the same device for suspending strainer pails and coffee boilers, also for lanterns and gallon oil cans. The engraving (Fig. 343) herewith shows the general arrangement. The ring on which the cages are hung is made of  $\frac{1}{4}$ -inch round iron, is 4 feet in diameter, and provided with four No. 12 common wires attached at equal distances apart. The other end is attached to a 1-inch or  $1\frac{1}{4}$ -inch breeching ring, to which is attached in turn a  $\frac{1}{4}$ -inch rope. This rope runs to the ceiling through a common pulley at one side of the store, then across to another pulley and down to the second ring, from

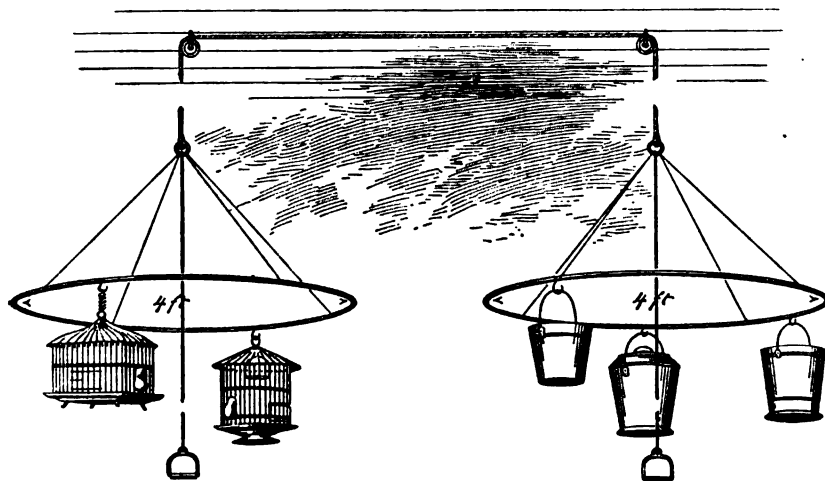


Fig. 343.—Arrangement of Bird Cages, Pails, etc.

which are suspended a dozen pails. Two rings of this kind will hold a dozen bird cages and a dozen pails, the one balancing the other. The arrangement is such that one ring can be pulled down by means of a string attached, as shown in the engraving, to within 5 feet of the floor, while the other ring goes to the ceiling, which is about 10 feet. If it is desired both rings may be adjusted to a distance of  $7\frac{1}{2}$  feet from the floor, so as to be out of the way. This plan is said to be very convenient, and appears to fully meet all the requirements of the case.

#### Cheap Stove Truck.

Take 1 x 6 inch lumber and saw as shown in Fig. 344, which gives four right-angled triangles to be used for corner-pieces. Then get out four strips of suitable length,  $3 \times \frac{1}{4}$  inch, for ends

and sides, and nail to corner-pieces as shown in Fig. 345, the corner-pieces being nailed in the center of the strips, so they are 1 inch below the edge of strip, which



Cheap Stove Truck.—Fig. 344.—Triangular Pieces for Corners of Truck.

prevents the stove legs from slipping off. Take a set of Martin's casters, screw one to each corner-piece, and by painting black

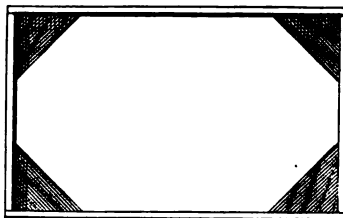


Fig. 345.—The Finished Truck.

or red one has a truck that cannot be beaten for cheapness, lightness and durability.

#### Make the Store Attractive.

The following interesting article on the subject of store fittings and attractions we take from a late issue of the *Merchant World*:

Talking with an old retail merchant recently, we were impressed with the following remark, which had so much common sense and good philosophy in it. He said: "The way to make the store attractive is to have the articles on hand when the people want them. I found this

perience that we dislike being told by the storekeeper that the article or articles we ask for are not on hand, and we form a sort of opinion not very favorable to the establishment. On the other hand, if we are promptly and efficiently served with the goods desired, there is at once a feeling of satisfaction and of good-will toward the merchant. At this time, when retail dealers are making out their memoranda for new goods, what an efficient aid such a book would be to them. After they had gone through the stock to get posted as to what goods to buy and what not, a daily memorandum of "articles not on hand" would fit in nicely, and the buyer would go to market with more definite and minute information as to the stock to be purchased than ever before.

A nice, well fitted up and convenient store building is not all that is required to increase and hold trade: a well-selected stock of goods is the most important matter. It is the variety and nicety of assortments which form the center of attraction. Store fittings and fixtures pleasant and agreeable are valuable accessories, but the main feature of interest to customers is the stock. In so far as the surroundings create a favorable impression, to that extent they are of value; it is, however, the goods for sale that are the chief consideration. Are they well selected and well bought? Do they possess styles, quality and general adaptness to the wants of the community in which they are to be sold? If in the buying of them all these essentials are fully met, the merchant can feel assured that he will have customers who will appreciate his skill and judgment in purchasing new assortments.

No merchant can make his store attractive who does not have an attractive stock. A nice, well-arranged store building and an ill-assorted stock of goods would form a bad partnership. The firm would not long continue in business, for it would expire for want of patronage. The period has again arrived for selecting new goods. Retail merchants are preparing to visit the large wholesale markets. Their success in business depends on their success in buying. To this department their special attention should be given. We have deemed it opportune, therefore, to dwell on this important feature of store attractions—the most important of all. Become fully posted as to the stock on hand, so that the same class of goods will not be repurchased; note the styles and fabrics that have not sold freely, so as to avoid them in future; get a clear idea as to the quantity of new goods required, so as not to overbuy, and finally, be determined that this autumn you will have the best assorted stock on sale you have ever kept.

Ex-Consul Withers, representative of the late Administration at Hong Kong, remarked the other day that in some respects the United States is commercially gaining a better footing in Hong Kong, while in others it is rapidly losing ground. "In cotton goods particularly," he said, "we are not nearly as strong as a few years ago. The English and Germans seem to be crowding American cotton goods products out of the market. Then in the petroleum supply America once sent China through Hong Kong nearly all of this oil. Refining in Russia has advanced to the point where her product is taking the place of Pennsylvania oil, and this trade has fallen off unmercifully. In one thing the United States holds her own. The Chinese have taken a great fancy to clocks and watches, and so country seems to be able to compete with Yankee enterprise in this direction. Americans monopolize this branch of trade wholly, and indications are that they will continue to do so."



## Paints and Oils.

### Paints and Colors.

The rapid advance in the price of National Lead Trust Certificates on the Stock Exchange, and the announcement in explanation thereof that the Collier and the Southern companies have joined the trust, has been the uppermost feature of interest in the White-Lead market. Persons conspicuous in the speculation assert that the trust, with these acquisitions, will control 60 % of all of the corrodors of the country and that the "combine" would be in a fair way to dictate to the White Lead Manufacturers' Association on all matters of production and prices. Not only that, but a suspicion is created that with the companies named and the Atlantic Company secured the trust will fall into Standard Oil control and ultimately force independents into the fold or freeze them out of the business by methods in which the Standard interest is highly accomplished. As for business in Leads, there is little to note apart from the fact that it is of good average volume, with former prices and rebates current.

*Red Lead* and *Litharge* continue to meet with good, steady sale, and prices for pigments are well maintained, both by manufacturers and jobbers.

*Paris Green* is moving quite freely in delivery on back orders, and manufacturers report a good amount of new business as well. The association prices and discounts remain unchanged, and no underselling by jobbers is attempted.

*American Zincs* continue to meet with quite a liberal sale, and prices for the several grades are well maintained. Foreign Zincs are selling in a satisfactory way and at firm prices.

The high price of *Quicksilver* has stimulated purchases of Quicksilver Vermilion to some extent, but manufacturers are filling current orders at old prices. Lead Vermilion is selling very fairly at steady prices.

*Venetian Red* of the lower grades is a trifle weak, with sales of both English and American reported at as low as 90¢ per 100 lb, but the high grades are quite firm and selling fully as well as the cheaper article.

In other dry Colors there is little or no business of other than routine character, and prices are showing no material variation. Colors in oil move steadily at former prices.

*Chalk*, *Whiting*, *Paris White*, *Talc* and *Terra Alba* are not better than barely steady at previous prices, and meet with rather slow movement in other than jobbing quantities.

In order to serve the convenience of the trade in these lines, it will be observed that on pages 888 and 58 we give quotations on an extended assortment of paints, oils, colors, &c.

### Oils.

City crushers are experiencing a good, steady demand for *Linseed Oil*, which, apart from other conditions, keeps the market for their product in a strong position. The cost of Seed, however, figures in no small degree as a factor, and the advices from foreign markets, as well as the reports from the West, indicate that the price of the raw material is more likely to advance still further than to decline during the next three months. As yet orders are filled at 59¢ for raw Oil and 62¢ for boiled, but an advance to 60¢ for the former is liable to be made any day. Comparatively little Western Oil comes this way, and 57¢ is the lowest price at which any of it is sold. Jobbers are said to be selling considerable Rosin Oil in mixture with pure Linseed, and the consumption of the latter is thereby cut down fully 20 %.

*Cotton-Seed Oils*, after a somewhat protracted period of dullness, are selling with greater freedom, and the increased business has led to a decided hardening of prices, particularly for the crude article. There have been transactions in the article the past week involving fully 2500 barrels, at from 34¢ @ 35¢ for inferior qualities, up to 40¢ for prime. Several hundred barrels of Summer Yellow have been placed also, mainly on the basis of 48¢ for prime. The American Cotton Trust interest is said to have purchased more or less "independent" Oil and thereby toned the market up considerably. In connection with the rise on Cotton Oil certificates on the Stock Exchange, these purchases are looked upon as ominous by some parties, but the advance was really due to reports of a probable dividend announcement.

*Lard Oil*—Has ruled quite firm during the week, under the support of a good steady demand, together with harmonious relations between city pressers and moderate offerings from the West. Present make prime brings 56¢ in round lots and 57¢ in jobbing quantities, while Winter Pressed is strong at 60¢ and the low grades fairly steady.

There has been no change whatever in *Sperm* or *Whale Oils*. The crude products are very firmly held at New Bedford, although the supply on hand is quite liberal, and the manufactured Oils have steady sale at unchanged prices.

*Crude Menhaden Oil*—Is looking rather weaker; manufacturers have been free sellers of Pressed, Bleached and Tanners' Oils at low prices, while holders of crude manifest some anxiety to unload in view of the near approach of the new fishing season. New Southern crude has been offered at 25¢, with indifferent results, and over 28¢ is exceptionally high on Sound.

Three cargoes of *Cocunut Oil* have been detained at distant points by disasters to ships, and no fresh arrivals prior to August are expected. Prices are therefore strong and tending upward.

In other Oils there has been merely the routine business, and prices have undergone no striking changes.

It is claimed that the recently-completed San Diego flume in California is the most stupendous ever constructed in the world, being only a little short of 36 miles long. An idea of the gigantic character of the work may be obtained from the fact that the amount of lumber consumed was more than 9,000,000 feet, or, allowing the very considerable yield of 1000 feet to each tree, not less than 9000 trees were required. In the course of the flume there are some 315 trestles, the longest of these being 1700 feet in length, 85 feet high and containing 250,000 feet of lumber. Another trestle is of the same height and 1200 feet long, the main timbers used in both of these being 10 x 10 and 8 x 8, being put together on the ground and raised to their position by horse power. The number of tunnels in the course of the flume is eight, the longest of which is 2100 feet, the tunnels being in size 6 x 6 feet, with convex-shaped roofing. Each mile of the flume required an average of 250,000 feet of lumber for its construction, and the redwood used entirely in the box is 2 inches in thickness throughout.

Consul Bissinger, at Beirut, Syria, in a report to the Department of State, says that Syrian silk growers now look covetously toward the United States as a market for raw silks. Silk reellers in Syria are manifesting much anxiety to establish direct intercourse with manufacturers in the United States. The silk cultivator, however, is puzzled to know why the United States manufacturer should want to pay an advance of 8 to 10 per cent. for Syrian

silk in the form of commissions to Marseilles and Lyons firms, when he could put himself in direct communication with reputable Syrian firms which are eager to establish mutually profitable relations.

### An Elegant Passenger Steamer.

The Continental Iron Works, of Brooklyn, N. Y., launched on the 21st inst. the hull of a new propeller for the passenger line plying between Albany and Catskill-on-the-Hudson. She was christened the General Butterfield, in honor of that gentleman, who is financially interested in the line and one of its principal managers. The Butterfield is the usual type of an iron and steel vessel as is generally constructed at the present time. She is 180 feet on the water-line and 140 feet over all, 28 feet beam and 9 feet 6 inches depth of hold. The motive-power will consist of compound engines, with 17-inch high-pressure and 32-inch low-pressure cylinders and 2 feet stroke. The boilers will be of the ordinary horizontal tubular type. She will have three water-tight bulkheads and steam steering apparatus. Her joiner work will be of the most elegant and costly character, and her entire furnishings will be in keeping with the munificence displayed of late years in the adornment of river craft, including electric lights and bells. The Continental Iron Works are located in what is known as the Eastern District of Brooklyn, and are historical for having launched from their capacious yard some of the largest and most important iron vessels built in this country, among which were many ships of war. The officers of the company are: Thos. F. Rowland, president; Warren E. Hill and Chas. E. Corbett, vice-presidents, and Thos. F. Rowland, Jr., secretary and treasurer.

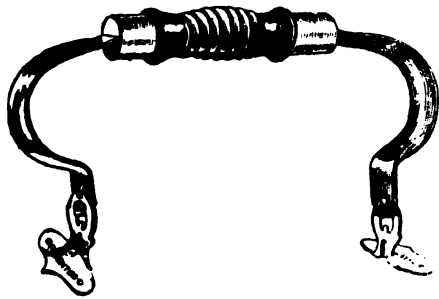
A new company, organized for the purpose of conducting transportation on the lakes, propose to put 12 mammoth steel steamers into the water as fast as they can be built. A telegram from Duluth says the boats will be constructed at Sandusky, on Lake Erie, and will cost in the neighborhood of \$325,000 each. They will be 326 feet long each, with a carrying capacity of 3500 tons. They will be named after States, the six Eastern States being the names of the freight boats and the six Western ones being the passenger craft. This line will be called the States-Anchor Line, and the capital is said to be \$12,000,000. Prominent railroad men, principally of the Pennsylvania system, are the projectors of the line, which, when completed, will be by far the most complete on the chain of lakes.

It is said that proof of serious discrimination in import rates against the port of New York has been gathered by the New York trunk lines. Tin-plate furnishes the most glaring instance of the ocean and rail rate combined being less than the inland rate alone from New York and Philadelphia. Early in May the rate on tin-plate from Liverpool to Chicago by way of Philadelphia was 22/6 per ton of 2240 pounds. This is equivalent to a through rate of 24 1/8 cents per 100 pounds, against a rate from New York to Chicago of 30 cents per 100 pounds, and from Philadelphia to Chicago of 28 cents. The through rate from Liverpool to Indianapolis is 23/6 per ton—equal to 25 1/8 cents per 100 pounds, against a New York rate of 28 cents and a Philadelphia rate of 26 cents. From Liverpool to St. Louis a rate of 27/6 per ton, or 29 1/8 cents per 100 pounds, has been allowed, while the New York rate is 35 cents and the Philadelphia rate 33 cents.



### The Empire Tea-Kettle Handle.

The Empire State Mfg. Company, of Buffalo, N. Y., have placed upon the market a patent handle designed for use in connection with tea-kettles and similar utensils. This handle is made of brass and



Empire Tea-Kettle Handle.—Fig. 1.—General View of Handle, Showing Method of Connecting Ears with Bail.

provided with ears of such construction that the bail may be retained in any position desired. In Fig. 1 of the accompanying illustrations is shown a general view of the handle, bail and ears, the manner of joining the latter being clearly indicated. Figs. 2 and 3 show the

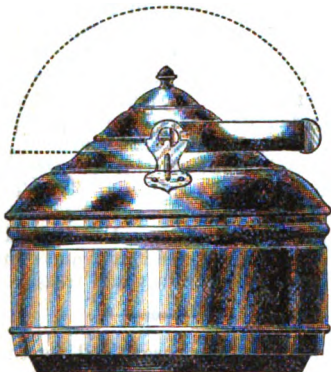


Fig. 2.—Showing Handle in Horizontal Position, with Dotted Line Indicating Range of Positions.

handle attached to a kettle, and indicate by means of the dotted lines the range of positions in which the handle may be placed. The work of combining the ears and bail of the handle is performed by

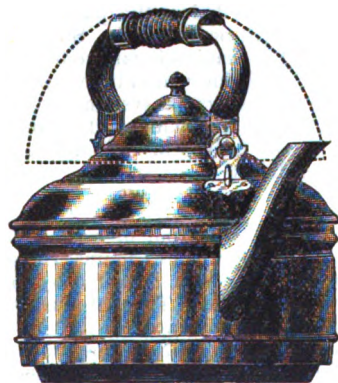


Fig. 3.—Handle in Vertical Position.

means of a press, thus insuring accuracy and uniformity of execution. The ears are so shaped as to readily fit a tea-kettle breast, and are connected to the bail without the use of rivets. The peculiar manner of effecting this junction is one of the principal features of the device to which the makers direct attention. The portion of the article which comes in contact with the hand is made of wood carefully enameled and of the proper size. The Empire tea-kettles upon which this handle is used are made in two styles—full copper and half copper. The former style is made

of heavier stock and higher breast than the latter, and has a copper spout, while the latter has a tin spout. Extra brass is used in making the handles for the copper kettles, while tin is employed in those for the half-copper kettles. The device is very simple in construction and is claimed to possess advantages in the way of convenience and utility which cannot fail to be appreciated by all in the trade.

### Bean's Compact Home.

The accompanying illustration, Fig. 1, represents an outfit for camping, beach parties, lawn use, and also for surveyors, trappers, &c., which is put on the market by E. D. Bean, 147 Washington street,

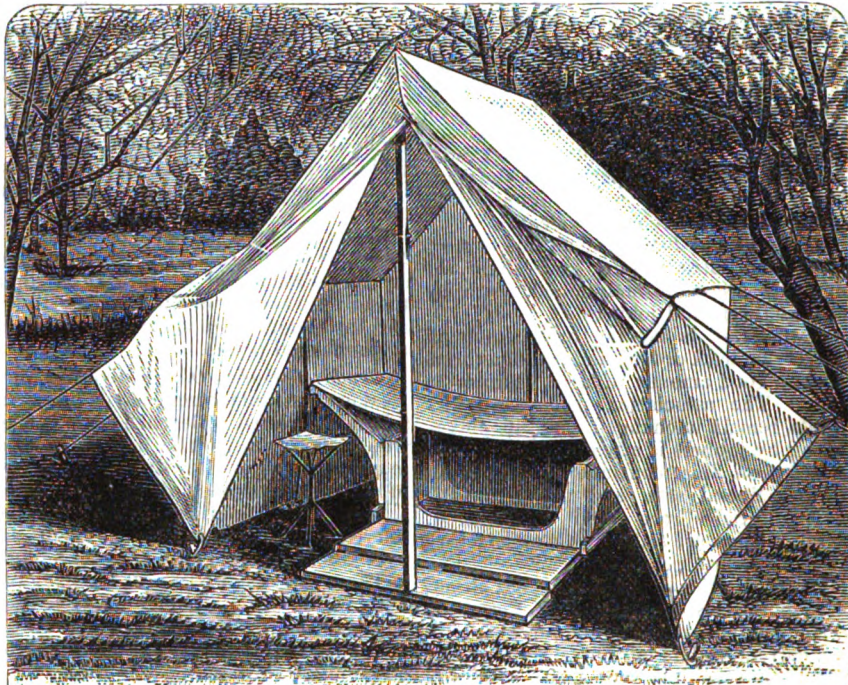


Fig. 1.—Bean's Compact Home.

Boston, Mass. When packed and ready for shipment its appearance is similar to an ordinary water-proof canvas-covered trunk, as shown in Fig. 2, which gives also, it will be observed, the weight and dimensions of the outfit. When ready for occupancy it is arranged in the form of a tent, as shown in Fig. 1. The end covers when opened form a support for the bed, which is 3 feet wide, 6 feet 4 inches long and 18 inches from the ground, and is readily removable. The trunk or box is constructed so that it forms two seats when open. The front side is hinged to the bottom and turned down to the ground, with half of the covers forming the floor. The tent poles stand on the outer edge of the side covers. The trunk is made of

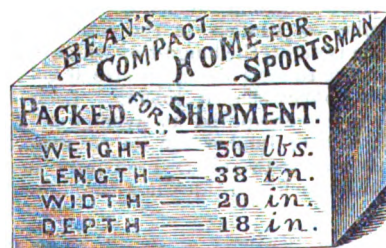


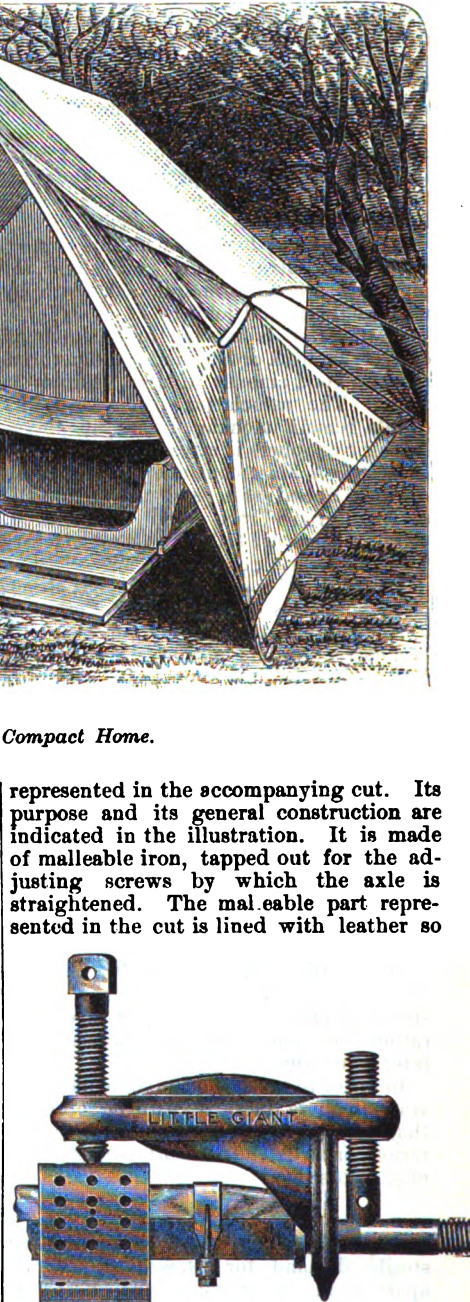
Fig. 2.—Compact Home Packed for Shipment.

matched lumber, has 19 wrought-iron hinges and is braced throughout. The home or tent thus provided is referred to as large enough for the accommodation of two persons, with ample room for packing guns, fishing-rods, &c. This home is

manufactured in two grades from the same material, the difference being in finish. One is plain with a white tent and the other finished in colors, said to be very attractive in appearance. The home thus furnished is 6 feet 4 inches long, 5 feet wide and 6 feet 6 inches high. Its adaptation to the purposes for which it is intended, its convenience and comparative inexpensiveness are points made in regard to it. Prices are referred to in the Trade Report.

### The Little Giant Axle Setter and Straightener.

This article is manufactured by Wells Bros. & Co., Greenfield, Mass., and is



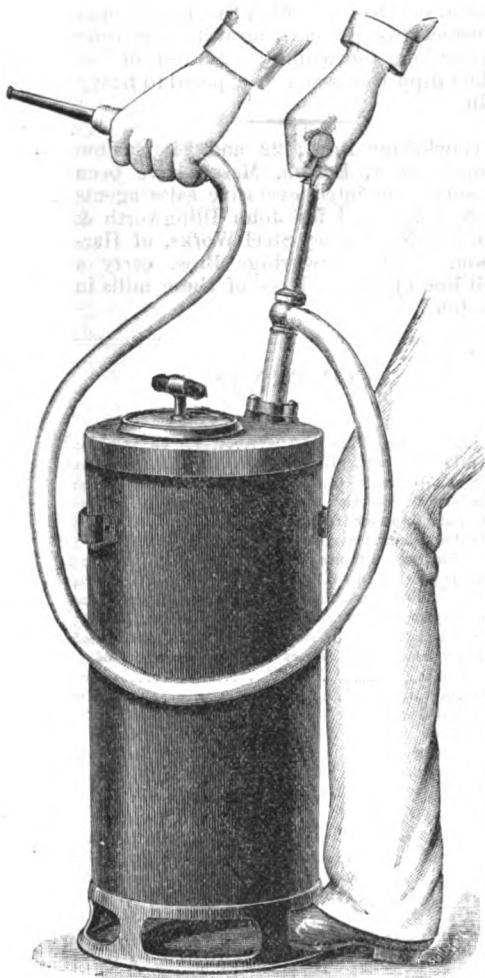
Little Giant Axle Setter and Straightener.

as not to mar the paint. In use the straightener is placed on the axle, and with the bearing on the round bolt tight the square-head bolt is turned up and the axle forced into position. The straightener can be applied in any position necessary to make the axle straight. The manufacturers mention that by this means axles bent in any shape can be set, without removing the axle, to their original shape, and claim that four axles can be straightened in less time than is usually required to remove one axle preparatory to setting it.



**Indurated Fiber Fire-Extinguisher.**

Among the latest novelties in indurated fiber-ware offered to the trade by Cordley & Hayes, 173 Duane street, New York, is a fire-extinguisher of this material, which is illustrated in the accompanying cut. The apparatus as shown consists of a deep bucket covered with a proper arrangement to prevent evaporation and fitted with a hand force pump at one side, the Johnson patent fire-pump or the Hydrostatic Champion being used. The receptacle is charged with water, either pure or mixed with salt or other material to prevent

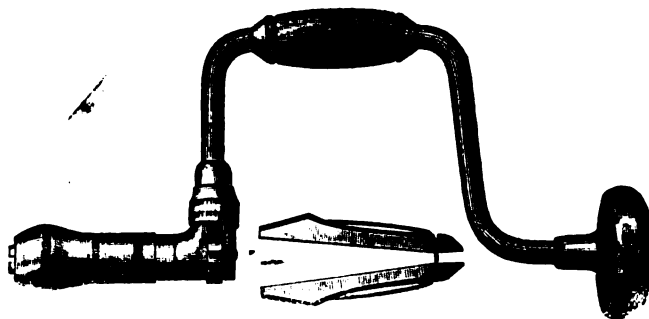
*Indurated Fiber Fire-Extinguisher.*

freezing. The chief advantages of this apparatus, as compared with other forms of extinguishers, are: It is very simple in construction, having no valves, cocks or appliances to be understood before using; is durable and easily re-charged, even when in use, and throws a large stream of water. The apparatus holds from 5 to 6 gallons of water, and has an extreme height of 2 feet 6 inches and diameter of 10 inches. The method of using it is indicated in the cut.

**Fray's Ratchet Brace.**

John S. Fray & Co., Bridgeport, Conn., are manufacturing the ratchet brace shown in the accompanying illustration, which shows some of the features of its construction. It is put on the market as embodying many advantages and as meeting the want for an article of this kind of excellent quality. The manufacturers call special attention to the arrangement of the ratchet. In it there are two hinged pawls of steel, which are kept in position with the ratchet-wheel, which is also of steel, by means of spiral springs, but are raised out of contact therewith by a concealed or

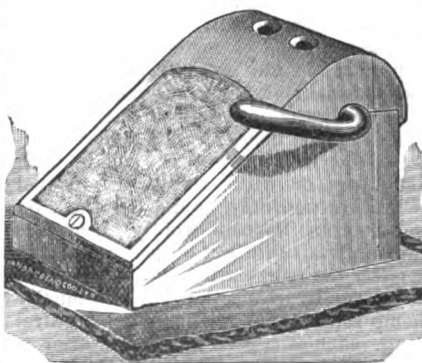
internal cam formed on the inside of a rotating ring, which fits into the ratchet frame. This ring, when in a central position, permits both pawls to be in contact with the ratchet-wheel, locking it and preventing any ratchet motion. Turning the ring to the right or left permits a forward or backward ratchet motion, as desired. The chuck or bit-holding device is Barber's style of socket and jaws. To these steel jaws a spring made of music

*Fray's Ratchet Brace.*

steel wire is added, and performs a double duty. Passing through the rear or inner ends of the jaws it acts as a pin, holding them in place with each other, while it permits the free movement of each to the full extent of the sleeve in adjustment to the different sizes and shapes and bit-shanks, and passing back of the jaws, in which a spring cavity is formed, the ends of the spring engage and act upon the jaws adjusted forward of the centers, holding them open through their length. The sweep, jaws, pawls and ratchet are of steel, the handle is of cocobolo, the head of lignum-vitæ, the whole well finished and the metal parts nickel-plated. The manufacturers allude to the advantages of this construction, and refer to the favor with which the brace has thus far been received. It is made in 8, 10, 12 and 14 inch sizes.

**Walker's Improved Cigar-Cutter.**

This article is made by the Erie Specialty Mfg. Company, 345-351 West Twelfth street, Erie, Pa. It is the invention of E. Walker, and a patent is pending covering its special features. Its form and appearance are shown in illustration below. It is constructed with holes of different sizes, under which a revolving knife is operated by a projecting lever,

*Walker's Improved Cigar-Cutter.*

which is to be pressed down to cut the cigar, and springs back to place when the pressure is removed. As will be seen by the cut, the front of the machine is set at an angle, where, when ordered in quantities, a polished bronze plate of raised letters advertising the customer's business is fastened, or it may be used to call attention to any desired brand of cigars.

The attractiveness of the design and the fact that the cutter is finely finished in nickel and bronze are points made in regard to it.

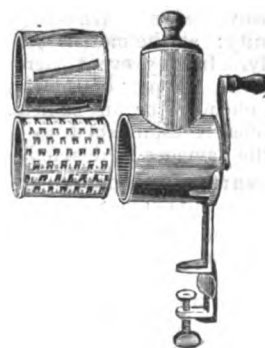
**Cream City Grater and Slicer.**

The Geuder & Paeschke Mfg. Company, of Nos. 162 and 164 West Water street, Milwaukee, Wis., are offering the trade an interesting novelty in the way of

a kitchen utensil, known under the name of the Cream City grater and slicer. Fig. 1 of the accompanying illustrations shows the grater, while Fig. 2 shows the other side of the device, which is used as a slicer. This article is strongly made throughout and is provided with a substantial handle and is claimed to be very rapid in operation. The statement is made that it is entirely self-cleaning, it only being necessary to rinse it in

*Fig. 1.—Front View of Grater.**Fig. 2.—View of Slicer.*

water. The slicer is so arranged as to be admirably adapted for slicing potatoes, apples, cucumbers and the like. Fig. 3 represents the Cream City revolving machine, adapted for grating and slicing purposes, but so constructed as to perform the work in much less time than by the use of the device first mentioned. This machine

*Fig. 3.—Revolving Grater and Slicer.*

is well made in all its parts, and is placed upon the market as a device well calculated to grind almonds and cut small vegetables for pickling. Patents are now pending covering the principal features of novelty.

## Legal Decisions.

### TELEGRAPH COMPANY—NIGHT MESSAGE—DELIVERY—DAMAGES—MESSAGE BURNT.

F. sent a night telegram to the office of the Union Stock Yards, at Chicago, at which there was a day office only. The message was received at Chicago during the night and put on the Stock Yards hook, whence night messages were taken and transmitted about half-past 6 in the morning. During the night, through atmospheric influences, a fire broke out in the Chicago offices and burnt everything up, this message included, the efforts to save these Stock-Yards-hook messages having failed. By the terms of this message it was taken at reduced rates on condition that it should not be delivered until morning, and there was in this same stipulation this provision: "The sender will not claim damages for errors or delays or for non-delivery of the message, happening for any cause, beyond a sum equal to ten times the amount paid for transmission." The sender, who had wired for a cargo of hogs, demanded damages for losses suffered by reason of the stock not reaching him, which caused him to break his contract to deliver it, and the company denied any liability for the failure to deliver the dispatch. An action was brought—Fowler vs. the Western Union Telegraph Company—in which two defenses were set up: 1. That by the terms of the blank used they were not liable beyond ten times the sum paid for the transmission of the message. 2. That they were not liable for non-delivery of the message at all, because of the destruction of the message by fire, which did not arise from their negligence. The Supreme Judicial Court of Maine in deciding the case ruled the first point against the company and the second in their favor. Judge Foster in the opinion said: "1. We are clearly of the opinion, however the courts of other States have decided, that the stipulation of the message-blank that the company shall not be liable for the failure, for errors, delays or omissions, 'happening from any cause,' is against public policy as unreasonable and void, because it protects the company from liability for their own negligence. Though the stipulation is part of the agreement to send the message at a reduced rate it is not valid, notwithstanding we hold the agreement to transmit it at the reduced rate binding on the company, there being a sufficient consideration therefor in the delay in delivery. 2. The company, however, are liable for negligence only, and we cannot see how they have been negligent in this case. They could not guard, so far as we are informed by the evidence in the record, against the fire which burned this dispatch, with the other contents of the Chicago office. It does not appear that the company had any reason to expect this calamity: at the most it was a possibility only. In any event there was no negligence on the part of their agents or agencies, chemical or mechanical, which must be clearly established to give the plaintiff the damages he demands."

### PARTNERSHIP—DISSOLUTION—MAIL AND COLLECTIONS.

A., who owned a soapstone quarry, made a partnership agreement with B., who had a mill to grind the stone, by which he was to supply the stone to be ground, and A. was then to receive the product and sell it on a commission, but all the money was to be paid to B., who was to manage the financial part of the business. The business was carried on under an assumed name, and the agreement came to an end. B. sued for an injunction to prevent A. from receiving and opening the mail addressed to the name of the business, though A. continued business in the same name. A preliminary injunction was

granted and a motion was made in the case—Wagoner vs. Warne—which the New Jersey Court of Chancery refused to vacate. It ordered that the mail should be delivered to a disinterested party, to receive and deliver the letters to each party as he might be entitled.

### COVENANT IN RESTRAINT OF TRADE—UNREASONABLE RESTRICTION.

P. entered into an agreement not to "manufacture, sell nor cause to be sold any seed-preparing machines of any description," and a suit was brought for an injunction to restrain him from violating this covenant. P.'s demurrer to the complaint was sustained, and the case—Berlin Machine Works vs. Perry—went to the Superior Court of Wisconsin, where the judgment was affirmed. Judge Lyon in the opinion said: "It is contended that restrictions of this character, if made as incidental to the sale of patents and a business thereunder, are valid, no matter how general and unlimited such restrictions may be. The rule is otherwise. Such restrictions to be valid must not be unreasonable, due regard being had to the subject matter of the covenant. The restriction here is not reasonable, since it is not necessary to protect the plaintiffs or their assignor, for it goes beyond the sale of such machines and prevents Perry from exercising his powers of invention."

### INSOLVENCY—PROPER BOOKS OF ACCOUNT.

A discharge in insolvency was denied by the Supreme Judicial Court of Maine, in the matter of Merryfield, a manufacturer of barrels, who bought small parcels of timber lands, about 300 acres in all, from which he cut the timber and made it into staves and headings at his own saw-mill, on the ground that he had not kept proper books of account, the court deciding that he was a "trader," and that his books must show the application and use of the money for which he became indebted in his business.

### Use of Ropes.

The following suggestions regarding the use of ropes we take from a translation in the *American Architect* of an article in the *Bautechnische Zeitung*:

With hemp ropes the character and probable strength may be judged in some degree from the appearance. A good hemp rope is hard, but pliant, yellowish or greenish-gray in color, with a certain silvery or pearly luster. A dark or blackish color indicates that the hemp has suffered from fermentation in the process of curing, and brown spots show that the rope was spun while the fibers were damp, and is consequently weak and soft in those places. Sometimes a rope is made with inferior hemp on the inside, covered with yarns of good material, but this fraud can be detected by dissecting a portion of the rope, or, in practiced hands, by its behavior in use. Other inferior ropes are made with short fibers, or with strands of unequal strength or unevenly spun. In the first case the rope appears woolly, from the number of ends of fibers projecting, and in the latter the irregularity of manufacture can be seen by inspection. Occasionally a hemp rope is spun with a core or central strand, such as is used in the interior of many wire ropes. This somewhat increases the strength, but the core, shut in by the outside strands, is liable to rot and infect the rest, and any rope with a musty, moldy smell should be rejected.

The best hemp comes from Russia, Switzerland, Alsace and Northern Italy, and it is said that the strongest fibers are obtained from plants grown at the foot of high mountains. Ropes to be used on board ships, or where they are liable to be often wet, are usually soaked in tar to preserve them, but the

tarring diminishes the strength by about one-third and increases the friction of the rope. The injurious action of tar upon the hemp-fibers seem not to be clearly explained, but it is said to be lessened by subjecting the tar, before applying it to the rope, to repeated melting and washing with water. The effect on a rope of soaking with water is, however, worse than that of saturating with tar. According to accurate experiments, the tensile strength of a wet rope is only about one-third that of the same rope in a dry condition, and a rope treated with grease or soap is weaker still, apparently through the influence of the lubricant in facilitating the slipping of the fibers. It should never be forgotten that hemp cords contract strongly on being wet, a dry rope 25 feet long shortening to 24 feet or less when dipped in water or exposed to heavy rain.

Hawkrigge Bros., 22 and 24 Custom House street, Boston, Mass., have been recently appointed exclusive sales agents in New England for John Illingworth & Co. and New Jersey Steel Works, of Harrison, N. J. Hawkrigge Bros. carry a full line of the products of these mills in Boston.

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# CURRENT HARDWARE PRICES.

MAY 29, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, w 1000—

Hicks & Goldmark's	50¢
F. L. Waterproof, 1-10's	55¢
E. B. Trimmer Edge, 1-10's	55¢
E. B. Grnd. Edge, Cent. Fire	75¢
Double Waterproof, 1-10's	75¢
Musket Waterproof, 1-10's	75¢
S. D.	30¢

Union Metallic Cartridge Co.

F. C. Trimmer	50¢
F. L. Ground	55¢
Cent. Fire Ground	75¢
Dbt. Waterproof	75¢
Dbt. Waterproof, in 1-10's	75¢
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	1.00

Cartridges

Rim Fire Cartridges	50¢
Rim Fire Military	15¢
Cent. Fire Pistol and Rifle	25¢
Cent. Fire, Military and Sporting	15¢

Blank Cartridges, except 22 and 32 cal.

additional 10 % on above discounts.

Blank Cartridges, 22 cal., \$1.75

Blank Cartridges, 32 cal., \$3.50

Primed Shells and Bullets

B. B. Caps, Round Ball, \$1.75

B. B. Caps, Con. Ball, Swgd., \$2.00

Primers

Berdan Primers, \$1.00

B. L. Caps (for Sturtevant Shells) \$1.00

All other Primers, \$1.20

Shells

First quality, 4, 8, 10 and 12 gauge

First quality, 14, 16 and 20 gauge

Star, Club, Rival and Climax brands

10 and 12 gauge

Club, Rival and Climax brands, 14, 16

and 20 gauge

Selfbold's Comb. Shot Shells

Brass Shot Shells, 1st quality

Brass Shot Shells, Club, Rival, Climax

I. X. L. 10 and 12 gauge

"Special," 16 gauge

"Special," 10 and 12 gauge

Fowler's Pat.

Shells Loaded—

A. M. Co. List No. 19, 1887

Wads—

U. M. C. &amp; W. R. A.—B. E., 11 up. \$2.00

U. M. C. &amp; W. R. A.—B. E., 9&amp;10. 2.30

U. M. C. &amp; W. R. A.—B. E., 7&amp;8. 2.60

U. M. C. &amp; W. R. A.—P. E., 11 up. 4.10

U. M. C. &amp; W. R. A.—P. E., 9&amp;10. 4.90

U. M. C. &amp; W. R. A.—P. E., 7&amp;8. 4.00

Eley's B. E., 11 up. \$1.75

Eley's P. E., 11 up. \$2.00

Anvils—

Eagle Anvil, \$104

Peter Wright's

Armstrong's Mouse Hole

Armstrong's Mouse Hole, Extra 11

Trenton

Wilkinson's

J. &amp; Riley Carr, Pat. Solid

Moore &amp; Barnes Mfg. Co.

Anvil Vise and Drill—

Millers Falls Co., \$18.00

Cheney Anvil and Vise

Allen Anvil and Vise, \$3.00

Apple Parers—

Advance

Antrim Combination

Baldwin

Champion

Eureka, 1888

Family Bay State

Gem

Gold Medal

Hudson's New '88

Ideal

Improved Bay State

Little Star

Monarch

New Lightning

Orion

Penn

Perfection

Pomona

Rocking Table

Turntable

Victor

Waverly

White Mountain

72

76

78

Augers and Bits—

Douglas Mfg. Co.

Wm. A. Ives &amp; Co.

Humphreysville Mfg. Co.

French, Swift &amp; Co. (F. H. Beecher)

Rockford Bit Company

Cook's, Douglas Mfg. Co.

Cook's, N. H. Copper Co.

Ives' Circular Lip

Patent Solid Head

C. E. Jennings &amp; Co., No. 10, extension

Hip

C. E. Jennings &amp; Co., No. 30

C. E. Jennings &amp; Co., Auger Bits, # set

32 1/4 quaters, No. 5, \$5; No. 30, \$3.50

Lewis' Patent Single Twist

Jennings' Augers and Bits

Imitation Jennings' Bits

Fugh's Black

Rockford, Jennings' Pattern

Car Bits

L. Hommedieu Car Bits

Forstner Pat. Auger Bits

## Hollow Augers—

Ives'	25¢
French, Swift & Co.	25¢
Douglas'	25¢
Bonney's Adjustable, # doz	48
Stearns' No. 1, # doz	20
Ives' Expansive, each \$4.50	50¢
Universal Expansive, each \$4.50	20¢
Wood's	25¢

## Expansive Bits—

Clarks' small, #18; large, #20	35¢
Ives' No. 4, # doz	80
Swan's	40¢
Stearns' No. 1, #20; No. 2, #22	30¢
Stearns' No. 2, #28	20¢

## Gimlet Bits—

Common	\$ gross \$2.75 @ \$3.25
Diamond	\$ doz \$1.10
Bee	25¢
Double Cut, Shepardson's	45¢
Double Cut, Ct. Valley Mfg. Co.	30¢
Double Cut, Hartwell's, # gro.	55¢
Double Cut, Douglas'	40¢
Double Cut, Ives'	60¢

## Bit Stock Drills—

Morse Twist Drills	50¢
Standard	50¢
Cleveland	50¢
Syracuse, for metal	50¢
Syracuse, for wood (wood list)	80¢
Williams' or Holt's, for metal	50¢
Williams' or Holt's, for wood	40¢

## Ship Augers and Bits—

L'Hommedieu's	15¢
Watrous'	15¢
Snell's	15¢
Snell's Ship Auger Pat'n Car Bits	15¢

## Awl Hafts—

Sewing, Brass Fer. # gr.	35.50
Pat. Sewing, Short, #1.00 # doz	40
Pat. Sewing, Long, # gr	1.80
Pat. Peg, Plain Top, # gr	10.00
Pat. Peg, Leather Top, # gr	12.00

## Awls, Brad Sets, &c—

Awls, Sewing, Common # gr	17.70
Awls, Should. Peg, # gr	22.45
Awls, Pat. Peg, # gr	38
Awls, Shouldered Brad, 2.70 # gr	35
Awls, Handled Brad, # gr	7.50
Awls, Handled Scratch # gr	7.50
Awls, Socket Scratch, # doz	15.00

## Awl and Tool Sets—

Aiken's Sets, Awls and Tools	No. 20, # doz \$10.00
Fray's Adj. Tool Hds., Nos. 1, #12; 2, #18; 3, #12; 4, #20	25¢
Miller's Falls Adj. Tool Hds.	25¢
Nos. 1, #12; 2, #18	25¢
Henry's Combination Haft, # doz	35.50
Brad Sets	No. 42, \$10.50; No. 43, \$12.50
Stanley's Excelsior	No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50

## Axes—

Makers' and Special Brands—	
First quality	\$ doz \$8.00 @ \$8.50
Others	\$ doz \$6.50 @ \$6.75

## Axle Grease—

Fraser's	Keg # 4, Pail # 5
Fraser's, in boxes	# gr \$9.50
Dixon's Everlasting, in bxs.	# doz 15
Dixon's Everlasting	10¢
Lower grades, special brands	# gr \$5.50 @ \$7.00

## Axles—

No. 1	4¢
Nos. 7 to 14	5¢
Nos. 15 to 18	4 1/2¢
Nos. 19 to 22	7¢
National Tubular Self-Oiling Standard	Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets	33 1/2¢
Over 10 sets	33 1/2¢

## Bag Holders—

Sprengle's Pat.	# doz \$18
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## Balances—

Spring Balances	50¢
Common 24-lb	\$ doz \$1.50
Chatillon's Spring Balances	50¢
Chatillon's Circular Spring Balances	60¢

## Bells—

## Hand—

Light Brass	70¢
Extra Heavy	60¢
White Metal	60¢
Silver Chime	33 1/2¢
Globe (Cone's Patent)	25¢

## Door—

Gong, Abbe's	33 1/2¢
Gong, Yankee	45¢
Gong, Barton's	40¢
Crank, Taylor's	25¢
Crank, Brooks'	50¢
Crank, Cone's	10¢

Crank, Connel's	20¢
Lever, Sargent's	60¢
Lever, Taylor's Bronzed or Plated	net
Lever, Taylor's Japanned	25¢
Lever, R. E. M. Co.'s	50¢
Pull, Brooks'	50¢
Pull, Western	25¢

## Crow—

Common Wrought	60¢
Western, Sargent's list	70¢
Kentucky, "Star"	20¢
Kentucky, Sargent's list	70¢
Dodge, Genuine Kentucky	70¢
Texas Star	50¢
Call	40¢
Farm Bells	\$ 36 @ \$44
Steel Alloy Church and School Bells	40¢

## Bellows—

Blacksmiths'	50¢
Molders'	40¢
Hand Bellows	40¢

## Belting, Rubber—

Common Standard	70¢
Standard	70¢
Extra	60¢
N. Y. B. & P. Co., Carbon	60¢
N. Y. B. & P. Co., Diamond	50¢

## Bench Stops—

Morrill's	# doz \$9, 50¢
Hotchkiss'	# doz \$5, 10¢
Weston's, No. 1, #10; No. 2, #9	25¢
McGill's	# doz \$3

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension	10¢
Barber's, # doz \$15.00	40¢
Ives, # doz \$20.00	60¢
Diagonal	# doz \$24.00, 40¢
Angular	# doz \$24.00, 40¢

## Blind Adjusters—

Domestic	# doz \$8.00, 33 1/2¢
Excelsior	# doz \$10.00
Washburn's Self-Locking	20¢

## Blind Fasteners—

Mackrell's, # doz, \$1.00	30¢
Van Sand's Screw Pat., #15 # gr.	60¢
Van Sand's Old Pat., #15.00 # gr.	55¢
Washburn's Old Pattern, # gr	\$9.00
Merriman's	new list
Austin & Eddy No. 2008, # gr	\$8.00
Security Gravity, # gr	\$9.00

## Blind Staples—

Barbed, 1/4 in. and larger	# 7 1/2 @ 8¢
Barbed, 3/4 in.	# 8 1/2 @ 9¢

## Blocks—

Ordinary Tackle, list May 20, 1889	40¢
Cleveland Block Co., Mal. Iron	50¢
Moore's Novelty, Mal. Iron	50¢

## Bolts—

## Door and Shutter—

Cast Iron Barrel, Square, &c.	70¢
Cast Iron Shutter Bolts	70¢
Cast Iron Chain (Sargent's list)	65¢
Ives' Patent Door Bolts	70¢
Wrought Barrel	70¢
Wrought Square	70¢
Wrt Shutter, all Iron, Stanley's	60¢
Wrt Shutter, Brass Knob	40¢
Wrt Shutter, Sargent's list	60¢
Wrt Sunk Flush, Sargent's list	55¢
Wrt Sunk Flush, Stanley's list	50¢
Wrt B.K. Flush, Com'n	55¢

## Carriage, Machine, &c.—

Com. list June 10, '84	75¢
Genuine Eagle, list Oct. '84	75¢
Phila. pattern, list Oct. '7, '84	75¢
R.B. & W., old list	70¢
Machine, according to size	75¢
Bolt Ends, according to size	75¢

## Tire—

Common, list Feb. 23, '83	70¢
Port Chester Bolt and Nut Company	
Empire, list Feb. 23, '83	70¢
Phila., list Oct. '84	82 1/2¢
Keystone, Philadel., list Oct. '84	80¢
Norway, Phila., list Oct. '84	75¢
American Screw Company	
Norway, Phila., list Oct. 16, '84	75¢
Eagle, Phila., list Oct. 16, '84	80¢
Phila., list Oct. 16, '84	82 1/2¢
Bay State, list Feb. 23, '83	70¢
R.B. & W., Philadel., list Oct. 16, '84	82 1/2¢

## Stove and Plow—

Stove	65¢
Plow	60¢
R. B. & W., Plow	55¢

## Borax—

# 9 1/2 @ 10 1/2¢	
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## Boring Machines—

Without Augers	
Douglas	\$5.50
Snell's, Rice's Pat.	5.50
Jennings	5.50
Other Machines	2.35
Phillips' Patent with Augers	00 7.50

## Bow Pins—



Cross-Cut Saw Handles—  
 Atkins, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Boynton's Loop Saw Handles, 50¢. 15¢  
 Champion..... 15¢

**Hangers—**

Barn Door, old patterns, 60¢10¢10¢70¢  
 Barn Door, New England, 60¢10¢10¢70¢

Samson Steel Anti-Friction..... 55¢  
 Orleans Steel..... 55¢

Hamilton Wrought Wood Track..... 55¢  
 U. S. Wood Track..... 55¢

Champion..... 60¢10¢  
 Rider and Wooster, Medina Yfg. Co.'s..... 60¢10¢

Climax Anti-Friction..... 60¢  
 Climax Anti-Friction for Wood Track..... 55¢

Zenith for Wood Track..... 55¢  
 ed's Steel Arm..... 50¢

allenge, Barn Door..... 50¢  
 Sterling's Imp'vd (Anti-Friction)..... 60¢10¢

Victor, No. 1, 115.00; No. 2, 115.00; No. 3, 115.00..... 50¢2¢

Cheritree..... 50¢10¢  
 Kidder's..... 50¢10¢60¢

The Boss..... 60¢10¢  
 Best Anti-Friction..... 60¢10¢

Duplex (Wood Track)..... 60¢10¢6¢  
 Terry's Pat., 7 set pr. 4, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Crunk's Pat. No. 4, 112.00; No. 5, 114.40; No. 6, 118.00..... 50¢15¢60¢

Wood Track Iron Clad, 7 ft. 10¢..... 60¢

Carrier Steel Anti-Friction..... 60¢60¢2¢

Architect, 7 set \$6.00..... 30¢10¢

Eclipse..... 30¢10¢

Felix, 7 set \$4.50..... 30¢30¢10¢

Richards..... 30¢30¢10¢

Lane's Steel Anti-Friction..... 40¢10¢

Ball Bearing Door Hanger, 20¢10¢25¢10¢

Warner's Pat..... 20¢20¢10¢

Stearns' Anti-Friction..... 20¢20¢10¢

Stearns' Challenge..... 35¢10¢55¢10¢10¢

Faultless..... 40¢40¢5¢

American, 7 set \$6.00..... 20¢10¢

Rider & Wooster, No. 1, 62¢; No. 2, 75¢..... 40¢

Paragon, Nos. 1, 2 and 3..... 40¢10¢

Paragon, Nos. 5, 5½, 7 and 8..... 20¢10¢

Crescent..... 60¢60¢10¢

Nickel Cast Iron..... 50¢

Nickel Malleable Iron and Steel..... 40¢

Scranton Anti-Friction Single Strap, 88¢; 40¢

Scranton Anti-Friction Double Strap..... 40¢

Universal Anti-Friction..... 40¢

Wild West, 4 in. Wheel, 115.00; 5 in. Wheel, 121.00..... 40¢10¢40¢10¢5¢

Star..... 40¢10¢40¢10¢5¢

May..... 50¢5¢50¢10¢

Barry, 60.00..... 40¢10¢

**Harness Snaps—**

**Melasses Gates—**

Stebbin's Pat.	70¢@70¢7½
Stebbin's Genuine	60¢@10¢10
Stebbin's Tinned Ends	40¢@10
Chase's Hard Metal	50¢@10
Bush's	20¢
Lincoln's Pattern	70¢@70¢10
Weed's	20¢@10
Boss, ½ doz:	
Nos. 1, 7; No. 2, 8; No. 3, 9; No. 4	10.
	60¢@10¢10

**Money Drawers—**

½ doz, \$18.00	\$20
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**Muzzles—**

Safety	½ doz, \$3.00, 25¢
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**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87	70¢@10
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Wire Nails, Standard Penny	½ doz, \$2.50@2.80
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**Nail Puller—**

Curtiss Hammer	½ doz \$0.00
Giant, No. 1	½ doz, \$30.00, 10¢
Pelican	½ doz, \$20.00, 25¢
Boss	½ doz, \$30.00, 30¢
Lightning	½ doz \$21.00

**Nail Sets—**

Square	½ gr, \$4.00@4.25
Round	½ gr, \$3.25
Cannon's Diamond Point	½ gr, \$12, 20¢

**Nut Crackers—**

Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	½ doz \$20.00, 10¢
Turner & Seymour Mfg. Co.	50¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square, Hex.	
Hot Pressed	5.4¢ 5.9¢
Cold Punched	5.4¢ 5.9¢
In lots less than 100 lb, ½ m, add ¼¢; 1-b	
boxes, add 1¢ to list.	

**Oakum—**

Government	½ m 7½¢ @ 8¢
U. S. Navy	½ m 6¢ @ 7¢
Navy	½ m 5½¢ @ 6½¢

**Oilers—**

Zinc and Tin	65¢@65¢10
Brass and Copper	50¢@10¢50¢10¢5
Malleable, Hammers Improved, No. 1,	10¢@10
\$3.00; No. 2, \$4.00; No. 3, \$4.40 ½ doz.	
Malleable, Hammers, Old Pattern, same	
list	40¢
Prior's Pat. or "Paragon" Zinc	60¢@10¢10
Prior's Pat. or "Paragon" Brass	50¢
Olmstead's Tin and Zinc	80¢
Olmstead's Brass and Copper	50¢
Broughton's Zinc	80¢
Broughton's Brass	50¢

**Packing, Steam—**

Standard	60¢@10¢60¢10¢10
Extra	50¢@10¢60¢
N. Y. B. & P. Co., Standard	50¢@10¢5
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	70¢
Jenkins' Standard	½ m 65¢, 30¢

**Miscellaneous—**

American Packing	10¢@11¢ ½ m
Russia Packing	14¢ ½ m
Italian Packing	13¢@14¢ ½ m
Cotton Packing	15¢@17¢ ½ m
Jute	7¢@8¢ ½ m

**Padlocks—**

See Locks.	
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**Pails—**

Galvanized Iron—	
Quarts	10 12 14
Hill's Light Weight, ½ doz.	\$2.75 3.00 3.25
Hill's Heavy Weight, ½ doz.	3.00 3.25 3.75
Whiting's	2.75 3.00 3.25
Sidney Shepard & Co.	2.80 3.00 3.40
Iron Clad	2.75 3.00 3.25
Fire Buckets	2.75 3.25 3.50
Buckets, see Well Buckets.	

**Indurated Fibre Ware—**

Star Pails, 12 qt	½ doz \$4.50
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Fire, Stable and Milk, 14 qt	½ doz \$5.85
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**Pencils—**

Faber's Carpenters'	high list 50¢
Faber's Round Gilt	½ gr \$5.25
Dixon's Lead	½ doz \$4.50
Dixon's Lumber	½ gr \$6.75
Dixon's Carpenters'	40¢@10

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;	
6 to 7, \$13.00	60¢

**Picture Nails—**

Brass Head, Sargent's list	50¢@10¢10
Brass Head, Combination list	50¢@10
Porcelain Head, Sargent's list	50¢@10¢10
Porcelain Head, Combination list	40¢@10
Niles' Patent	40¢

**Plucking Irons—**

½ doz 65¢ net	
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**Pipe, Wrought Iron—**

List March 23, 1887.	
1½ and under, Plain	52½¢
1½ and under, Galvanized	55¢
1½ and over, Plain	65¢
1½ and over, Galvanized	62½¢
Boiler Tubes, Iron	
2½ and under	57½¢
2 in. to 2½ in.	62½¢
3 in. and larger	65¢

**Planes and Plane Irons—**

Wood Planes—	
Molding	50¢@50¢10
Bench, First Quality	80¢@80¢5
Bench, Second Quality	60¢@10¢60¢10¢10
Bailey's (Stanley R. & L. Co.)	40¢@10

**Iron Planes—**

Bailey's (Stanley R. & L. Co.)	40¢@10
Miscellaneous Planes (Stanley R. & L. Co.)	20¢@10
Victor Planes (Stanley R. & L. Co.)	20¢@10
Steer's Iron Planes	35¢@35¢5
Meriden Mal Iron Co.	30¢@10¢30¢10¢10
Davis's Iron Planes	30¢@10¢30¢10¢10
Birmingham Plane Co.	50¢@50¢5
Gage Tool Co.'s Self-Setting	20¢@10
Chaplin's Iron Planes	40¢@40¢5
Sargent's	30¢@10¢30¢10¢10

**Plane Irons—**

Plane Irons	20¢@10
Plane Irons, Butcher's	\$5.00@5.25 to 2
Plane Irons, Buck Bros	30¢
Plane Irons, Auburn Tool Co., "This-	
tle"	40¢
Sandusky Tool Co.:	
Single and Cut	30¢
Double	40¢
L. & I. J. White	25¢

**Pliers and Nippers—**

Button's Patent	30¢@10¢40
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	\$21.00
Humason & Beckley Mfg. Co.	50¢@50¢10
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢@5
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	60¢
P. S. & W. Tinner's Cutting Nippers	add 5¢ dis 10
Carew's Pat. Wire Cutters	30¢
Morrill's Parallel, ½ doz, \$12.00	30¢@5
Cronk's 8 in., \$15.00; 10 in. \$21.00	40¢@40¢5

**Plumbs and Levels—**

Regular List	70¢@10¢70¢10¢10
Diston's	45¢@10
Pocket Levels	70¢@10¢70¢10¢10
Davis Iron Levels	30¢
Davis' Inclometers	10¢@10

**Polish, Metal.**

Prestoline	20¢@10
Krestoline Paste	35¢@5
Gaston's Silver Compound	35¢@5

**Pokes, Animal—**

Bishop's I. X. L.	½ doz \$6.50
Bishop's O. K.	½ doz \$5.50
Bishop's Pioneer	½ doz \$3.75
Bishop's American	½ doz \$3.00

**Peppers, Corn—**

Round or Square, 1 qt.	½ gr \$12.00@15.00
Round or Square, 2 qt.	½ gr \$25.00@26.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger	½ doz \$36.00
Fletcher Post Hole Augers	½ doz \$30, 20¢
Eureka Diggers	½ doz \$19.00@17.00
Lead's	½ doz \$8.00@9.00
Vaughan's Post Hole Auger	½ doz
	\$13.00@14.00
Kohler's Little Giant	½ doz \$15.00
Kohler's Hercules	½ doz \$15.00
Kohler's New Champion	½ doz \$9.00
Schneider	½ doz \$18.00
Ryan's Post Hole Digger	½ doz \$24.00
Cronk's Post Bars	½ doz \$60.00
Gibbs Post Hole Digger	½ doz \$30.00, 50¢
Imperial	½ doz \$15

**Potato Parers—**

White Mountain	½ doz \$5.00@5.50
Antrim Combination	½ doz \$8.00
Hoosier	½ doz \$13.50

**Pruning Hooks and Shears—**

Diston's Combined Pruning Hook and	
Saw	½ doz \$18.00, 20¢@10
Diston's Pruning Hook	½ doz \$12.00
E. S. Lee & Co.'s Pruning Tools	20¢@10
Pruning Shears, Henry's Pat.	½ doz
	\$3.75@4.00 net
Henry's Pruning Shears	½ doz \$4.25@
	4.50 net
Wheeler, M. & C. Co.'s Combination,	
Dunlap's Saw and Chisel	½ doz \$12.00, 20¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	

**Pulleys—**

Hot House, Awning, &c.	60¢@10
Japanned Screw	60¢@10
Brass Screw	60¢@10
Japanned Slide	60¢@10
Japanned Clothes Line	60¢@10
Empire Sash Pulley	50¢@10
Moore's Sash, Anti-Friction	50¢
Hay Fork, Solid Eye, \$4.00; Swivel,	
\$4.50	50¢@10¢50¢10¢5
Hay Fork, "Anti-Friction," 5 in. Solid,	
\$5.70	60¢
Hay Fork, "F" Common and Pat.	
Bushed	20¢
Hay Fork, Tarbox Pat. Iron	20¢
Hay Fork, Reed's Self-Lubricating	60¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel	½ doz
\$12.00	40¢

**Pumps—**

Cistern, Best Makers	50¢@10¢60
Pitcher Spout, Best Makers	60¢@10¢60
	80¢@10
Pitcher Spout, Cheaper Goods	70¢@5

**Punches—**

Saddlers' or Drive, good	½ doz. 60¢@65¢
Bemis & Call Co.'s Cast Steel Drive	50¢@5
Bemis & Call Co.'s Springfield Socket	50¢@5
Spring, good quality	½ doz \$2.50@2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Sold Tinner's	½ doz \$1.44, 55¢
Tinner's Hollow Punches	20¢@25
Rice Hand Punches	15¢
Avery's Revolving	40¢
Avery's Saw-Set and Punch. See Saw Sets	

**Rail—**

Sliding Door, Wrt Brass	½ m 35¢
Sliding Door, Bronzed Wrt Iron	½ ft. 7¢
Sliding Door, Iron, Painted	½ foot 4¢, 40¢
Barn Door, Light In.	¼ ¾
Per 100 feet	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hanger	
Small, Med. Large	
Per 100 feet	\$2.15 2.70 3.25 net
Terry's Wrought Iron	½ foot. 45¢@5
Victor Track Rail	½ foot. 50¢@2
Carrier Steel Rail	½ foot. 41¢
Moore's Wrought Iron	25¢

**Rakes—**

Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢@10¢70
Malleable	70¢@70¢5
Gibbs Lawn Rake	\$12.00, 50¢@15
Canton Lawn Rake	\$9.00, 50¢@10
Ft. Madison Prize Bow Brace and Peer-	
less	65¢
Fort Madison Steel Tooth Lawn Rake	\$6.00
	25¢

**Razors—**

J. R. Torrey Razor Co.	30¢
Westenholme and Butcher, \$10.00 to 2,	10¢

**Razor Straps—**

Genuine Emerson	60¢@60¢5
Imitation	½ doz \$2.00, 20¢@10¢5
Torrey's	30¢
Badger's Belt and Com.	½ doz \$2.00
Lamont Combination	½ doz \$4.00

**Rivets and Burrs—**

Iron, list Nov. 17, '87	50¢
Copper	50¢@10¢60

**Rivet Sets—**

50¢@10	
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**Rods—**

Stair, Brass	25¢@2
Stair, Black Walnut	½ doz 40¢

**Rollers—**

Barn Door, Sargent's list	60¢@10¢10
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢

**Rope—**

Manufacturers' prices for large lots:	
Manila, ¼ in. and larger	½ m 15¢
Manila, ½ in.	½ m 16¢
Manila, ¾ in. and 5-16 in.	½ m 18¢
Manila Tarred Rope	½ m 15¢
Manila, ¼ inch and larger	½ m 15¢
Sisal, ¼ in.	½ m 13¢
Sisal, ½ in. and 5-16 in.	½ m 13¢
Sisal, Hay Rope	½ m 12¢
Sisal, Tarred Rope	½ m 12¢
Sisal, Medium Lathe Yarn	½ m 11¢
Sisal, Jute Rope	½ m 15¢@18¢ net
Jute Rope	½ m 8¢

**Rules—**

Hoxwood	80¢@10¢80¢10¢10
Ivory	50¢@50¢10
Starrett's Rules and Straight Edges,	
Steel	25¢@10

**Sad Irons—**

From 4 to 10, at factory	½ 100 m
China Heating	½ doz \$2.40@2.55
Self-Heating	½ doz \$0.00 net
Gleason's Sash and Trolley	½ doz \$18.00
Mrs. Pott's Irons	40¢@40¢10
Enterprise Star Irons	40¢
Combined Pluter and Sad Iron	½ doz,
	\$15.00
Fox Reversible, Self-Pluter	½ doz \$24.00
Laundry (N. E. Butt Co.)	8½¢, 15¢
New England	5¢, 15¢
Mahony's Troy Poi. Irons	25¢
Sensible	20¢@20¢5
National Self-Heating	30¢

**Sand and Emery Paper and Cloth—**

List April 19, 1888	50¢@50¢10
Sibley's Emery and Crocus Cloth	30¢

**Sash Cord—**

Common	½ m 10¢@11¢
Patent, good quality	½ m 13¢@13½
White Cotton Braided, fair	½ m 28¢@30¢
Common Russia Sash	½ m 13¢
Patent	½ m 15¢
Cable Laid Italian Sash	½ m 22¢@23¢
India Cable Laid	½ m 13¢
Silver Lake—	
A Quality, White, 50¢	10¢@10¢5
B Quality, Drab, 55¢	10¢@10¢5
C Quality, White, 50¢	20¢@10¢5
B Quality, Drab, 55¢	30¢@10¢5
C Quality, White (only)	20¢@28¢
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 38¢	
Semper Idem, Braided, White	30¢
Egyptian, India Hemp, Braided	25¢

Samson—	
Braided, White Cotton, 50¢	30¢@30¢5
Braided, Drab Cotton, 55¢	30¢@30¢5
Braided, Italian Hemp, 55¢	30¢@30¢5
Braided, Linen, 80¢	30¢@30¢5

**Sash Locks—**

Clark's, No. 1, \$10; No. 2, \$8 ½ gr.	33½¢
Ferguson's	60¢@2
Morris and Triumph, list Aug. 16, 1886	60¢@2
Victor	60¢@10¢2
Walters	25¢@30
Attwell Mfg. Co.	25¢@30
Reading	65¢@10¢65¢@10¢10
Hammond's Window Springs	40¢
Common Sense, Jap'd, Cop'd and	
B'zed	½ gr \$4.00
Common Sense, Nickel Plated	½ gr \$10.00



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# CURRENT METAL PRICES.

MAY 29, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
1 to 2 in. round and square...	\$ 1.90 @ ...
1 to 6 in. x 1/2 to 1 in. ....	\$ 2.00 @ ...
Refined Iron:	
1 to 2 in. round and square...	\$ 2.00 @ 2.10
1 to 4 in. x 1/2 to 1 in. ....	\$ 2.10 @ 2.20
4 to 6 in. x 1/2 to 1 in. ....	\$ 2.20 @ 2.30
1 to 6 in. x 1 1/4 and 5-16 ..	\$ 2.30 @ 2.40
Rods—1/2 and 1-16 round and sq.	\$ 2.10 @ 2.20
Bands—1 to 6 x 8-16 to No. 12 ..	\$ 2.20 @ 2.30
"Burden Best" Iron, base price ..	\$ 2.30 @ ...
Burden's "H. B. & S." Iron, base	\$ 2.80 @ ...
price ..	\$ 2.80 @ ...
"Uster" ..	\$ 2.80 @ ...
Norway Rods ..	\$ 4.00 @ 5.00

Merchant Steel from Store.	
Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base	2 1/2
price in small lots ..	5
Best Cast Steel, base price in small lots	5
Best Cast Steel Machinery, base price in	
small lots ..	5

Sheet Iron from Store.	
Common American.	R. G. Cleaned.
10 to 16 ..	\$ 2.75 @ 2.80
17 to 20 ..	\$ 2.85 @ 2.90
21 to 24 ..	\$ 2.90 @ 3.00
25 and 26 ..	\$ 3.00 @ 3.10
27 ..	\$ 3.10 @ 3.20
28 ..	\$ 3.20 @ 3.30
B. B. ..	\$ 3.30 @ 3.40
Galv'd, 14 to 20, # B. 4.50 @ ..	4.25 @ ..
Galv'd, 11 to 24, # B. 4.87 1/2 @ ..	4.75 @ ..
Galv'd, 25 to 26, # B. 5.25 @ ..	5.12 @ ..
Galv'd, 27 ..	\$ 5.32 1/2 @ ..
Galv'd, 28 ..	\$ 5.48 @ ..
Patent Planchet ..	\$ 5.85 @ ..
Russia ..	\$ 6.00 @ ..
American Cold Rolled B. B. ..	\$ 10 1/2 @ 10 1/4

English Steel from Store.	
Best Cast ..	\$ 15 @
Extra Cast ..	\$ 16 1/2 @
Swaged Cast ..	\$ 16 @
Best Double Shear ..	\$ 15 @
Blister, 1st quality ..	\$ 12 @
German Steel, Best ..	\$ 10 @
2d quality ..	\$ 9 @
3d quality ..	\$ 8 @
Sheet Cast Steel, 1st quality ..	\$ 15 @
2d quality ..	\$ 14 @
3d quality ..	\$ 12 1/2 @

METALS.	
Tin.	
Banca, Pigs ..	\$ 28 @
Straits, Pigs ..	\$ 22 @
English, Pigs ..	\$ 23 1/2 @
Straits in Bars ..	\$ 24 @

Tin Plates.	
Charcoal Plates.—Bright.	
Melny Grade.	
IC, 10 x 14 ..	\$ 6.75 @
IC, 12 x 12 ..	\$ 6.00 @
IC, 14 x 20 ..	\$ 5.75 @
IC, 20 x 28 ..	\$ 12.00 @
IX, 10 x 14 ..	\$ 7.25 @
IX, 12 x 12 ..	\$ 7.50 @
IX, 14 x 20 ..	\$ 7.25 @
IX, 20 x 28 ..	\$ 15.00 @
DX, 12 1/2 x 17 ..	\$ 5.50 @
DX, 12 1/2 x 17 ..	\$ 7.00 @
Call and Grade ..	\$ 5.75 @
IC, 10 x 14 ..	\$ 6.00 @
IC, 12 x 12 ..	\$ 6.25 @
IC, 14 x 20 ..	\$ 5.75 @
IX, 10 x 14 ..	\$ 7.25 @
IX, 12 x 12 ..	\$ 7.50 @
IX, 14 x 20 ..	\$ 7.25 @
IX, 20 x 28 ..	\$ 15.00 @
DC, 12 1/2 x 17 ..	\$ 4.75 @
DX, 12 1/2 x 17 ..	\$ 5.75 @
Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20 ..	\$ 4.75 @ \$5.00
10 x 20 ..	\$ 7.25 @
20 x 28 ..	\$ 9.75 @
IX, 10 x 14, 14 x 20 ..	\$ 5.50 @
BV Grade.—IC, 10 x 14, 14 x 20 ..	\$ 4.40 @
Charcoal Plates.—Terne.	
Dean Grade.—IC, 14 x 20 ..	\$ 4.35 @ \$4.62 1/2
20 x 28 ..	\$ 8.75 @
IX, 14 x 20 ..	\$ 5.40 @
20 x 28 ..	\$ 11.00 @
Abecarne Grade.—IC, 14 x 20 ..	\$ 4.25 @
20 x 28 ..	\$ 8.45 @
IX, 14 x 20 ..	\$ 5.25 @
20 x 28 ..	\$ 10.50 @

Tin Boiler Plates.	
IX, 14 x 26 ..	112 sheets @ \$12.50 @ \$12.75
IX, 14 x 28 ..	112 sheets @ 12.75 @
IX, 14 x 31 ..	112 sheets @ 14.25 @
Copper.	
Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢	
per lb. Manufactured (including all articles of	
which Copper is a component of chief value),	
45 ¢ ad valorem.	
Ingot.	
"Anchor" Brand ..	@ 13 1/4 ¢
" ..	@ 12 1/2 ¢

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Sheet and Bolt.	
Weights per square foot and prices per pound.	
Not wider than	Not longer than
Not wider than	Not longer than
Not wider than	Not longer than
Over 64 oz.	Over 64 oz.
30	30
32	32
34	34
36	36
38	38
40	40
42	42
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Fig. 1.—Diagonal Section Through one Leg of Tower.

**Fig. 2—Elevation of Cylinder, Showing Valves and Pipe Connections.**

THE AMERICAN ELEVATORS IN THE EIFFEL TOWER-PARIS EXPOSITION.





# THE IRON AGE

THURSDAY, JUNE 6, 1889.

## Elevators in the Eiffel Tower.

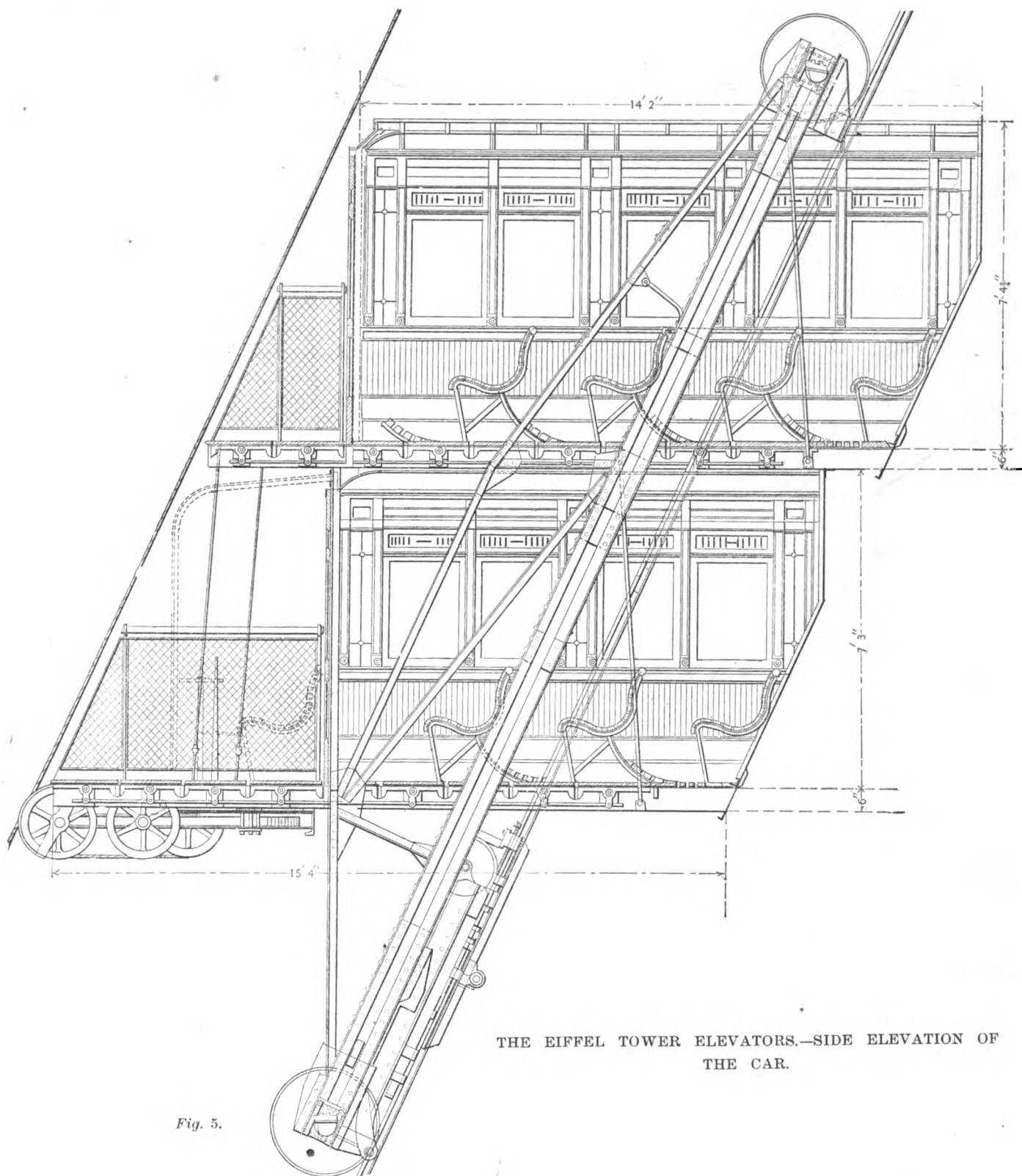
*With Supplementary Page of Engravings.*

Now that the Eiffel Tower, the greatest feature of the French Exposition, looking down as it does upon all the high struct-

general design of the work was adopted and well worked out, for unusual difficulties are presented by the nature of this design which render it impossible to use the ordinary lifts.

The four great legs of the tower spring from the corners of a square which measures about 375 feet on its sides, and they converge in a graceful vertical curve to-

neted by arches on each side of the square. These clear spans give architectural beauty to the design, and to avoid obstructing them, all means of ascent are placed in the legs and must conform to their curves and inclinations. In this respect the elevators are of the nature of inclined railways of very steep angle and varying gradients. The original design was to construct an



THE EIFFEL TOWER ELEVATORS.—SIDE ELEVATION OF THE CAR.

Fig. 5.

ures and monuments of the world, has been opened to the public, much interest centers in the various means supplied for its ascent. It would seem that little real thought was given to this necessary adjunct to the great structure until after the

ward the center of the square, meeting at a point some 400 feet above the foundation. Here is situated the middle landing, or second floor, and from this point the tower, more like ordinary structures, tapers to the top. The four legs are con-

ected by arches on each side of the square. These clear spans give architectural beauty to the design, and to avoid obstructing them, all means of ascent are placed in the legs and must conform to their curves and inclinations. In this respect the elevators are of the nature of inclined railways of very steep angle and varying gradients. The original design was to construct an

the middle landing. Here a change of cars is necessitated, and two elevators rise vertically in the center of the tower from the middle landing to the top. These could be of ordinary type, as only the usual conditions exist. The remaining two diagonal corners are occupied by machines rising on a straight incline to the first story, which is about midway between the foundation and the middle landing. Of these six elevators the two that present the greatest difficulties of construction, on account of their ascent at varying inclinations to the middle landing, are of American design, built by American manufacturers and successfully erected

under main-track structure, and shows the car as it approaches the level of the first landing. The profile starts at an angle of  $54\frac{1}{2}^\circ$  from the horizontal; it keeps this inclination for some distance, and then, conforming to the shape of the leg of the tower, it passes by a vertical curve to an inclination of  $78\frac{1}{2}^\circ$ . This is maintained to the end of the run, terminating at the middle landing, 395 feet vertically above the foundation. The length on the profile line, however, is about 420 feet, which is the actual distance traveled by the car.

The track structure consists of two regular girders, built in the tower legs especially for the elevator, upon which rest

precaution is necessary to prevent their displacement; hence extra anchorages are provided at intervals, so that the force of the descending car would be transmitted

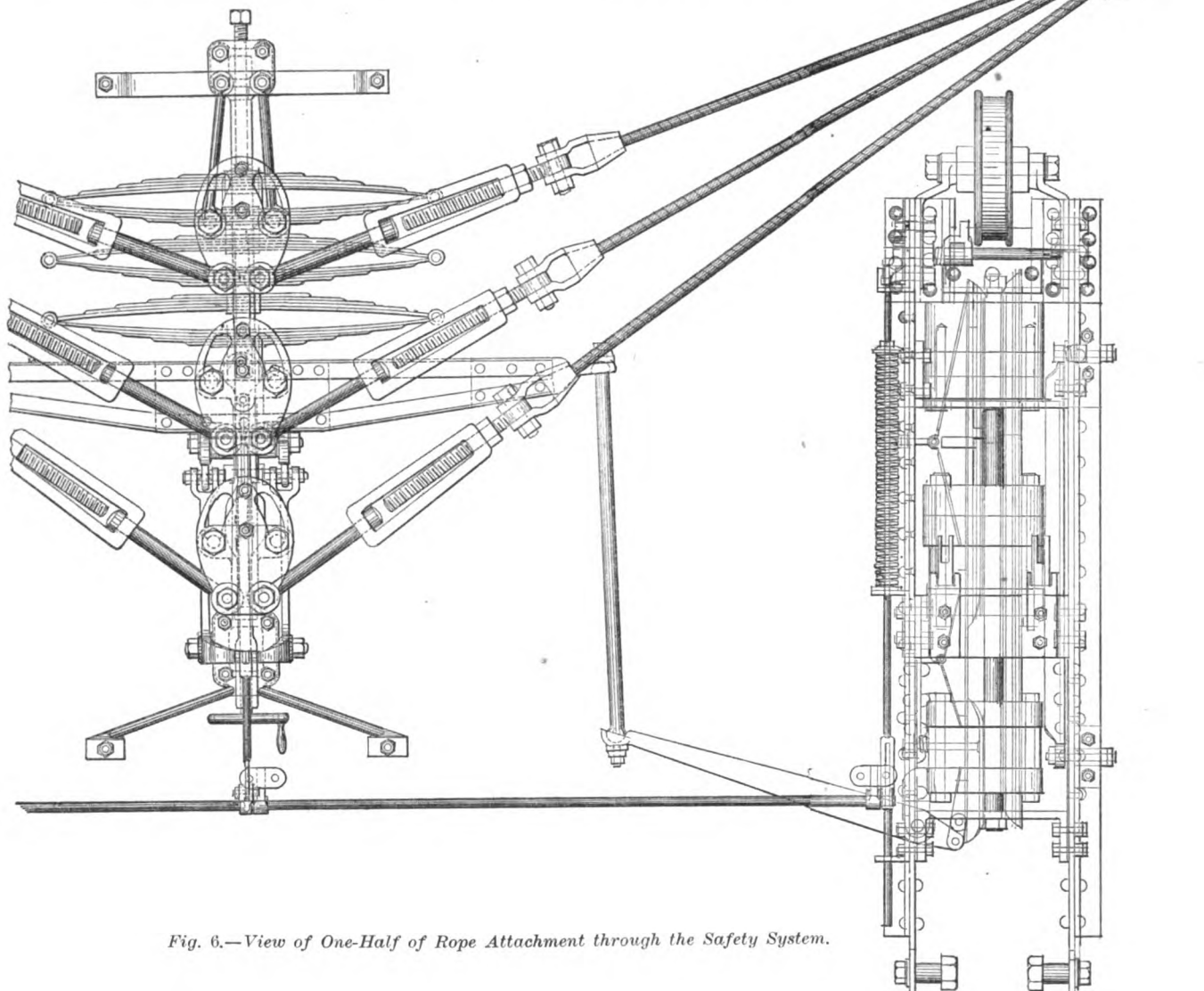


Fig. 6.—View of One-Half of Rope Attachment through the Safety System.

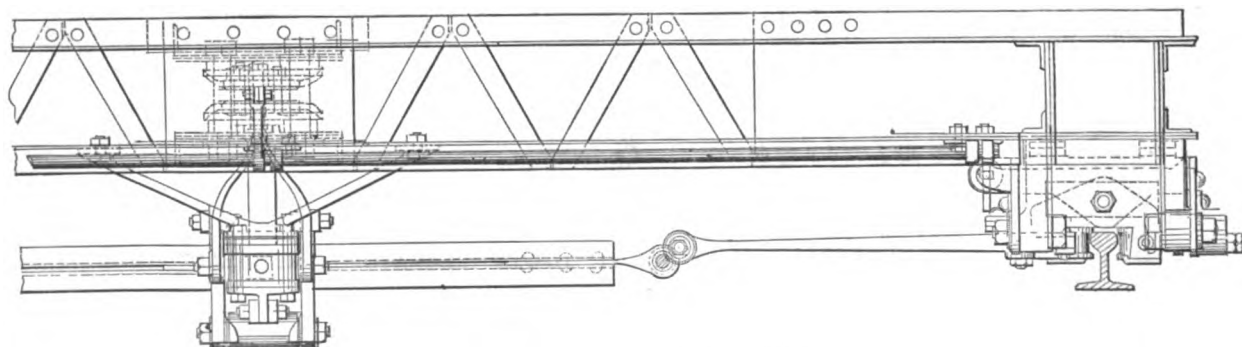


Fig. 9.—Safety Device and Frame.

under their superintendence. Fig. 1 shows a diagonal section through one leg of the tower to the height of the middle landing, and gives a true profile of track and track structure upon which the car runs. It also shows hydraulic cylinder, multiplying gear, overhead work, position of counter-balance and track, which lies directly

the rails, which are of ordinary type and are fastened to the girders in adjustable chairs in order that perfect alignment may be assured. The ends of rails are allowed to butt, it being considered that the whole inner structure will expand and contract together. In the case of the safety-grips coming into action upon the rails, every

directly to the girders without causing too long a section of rail to act as a column. The motor of the machine is a hydraulic cylinder, 42 feet long and 38 inches inside diameter, shown in detail, Fig. 2. In this moves the piston, the machine being so geared that 1 foot of movement of the piston effects 12 feet of movement of the

car. This is done by the use of the traveler, Figs. 3 and 4, a large riveted iron frame on trucks, and supporting six multiplying pulleys, each one 5 feet in diameter. To this frame the two piston-rods attach, and all moves directly as the piston.

The multiplication of speed is made complete by the use of auxiliary pulleys, which are shown at the top of cylinder girders in Fig. 1. These girders that support the cylinder, and upon which the multiplying gear travels back and forth between cylinder-head and auxiliaries, form an independent construction, and are particularly designed for the peculiar duty they are called upon to perform. Owing to the multiplication of speed, the direct pull on the piston-rods, of which there are two, is about 200,000 pounds. It was not permissible to take this pull directly upon the tower structure; hence it is transmitted by the auxiliaries back through the cylinder girders to the foundations, only such portion coming directly upon the tower, at the overhead work, as is required to lift the car and its load. The tower is, therefore, only called upon

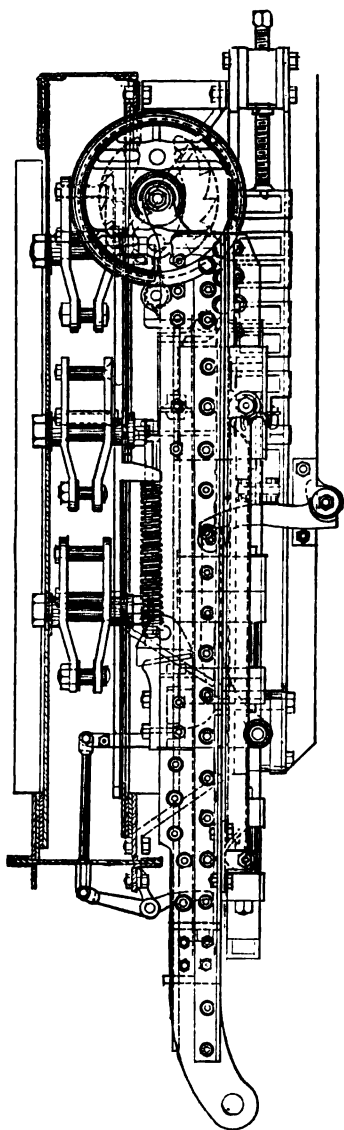


Fig. 10.—Side Elevation of Safety Device.

to support the cylinder girders and their load by means of hangers in the inclined position shown in Fig. 1, which is made as nearly vertical as possible to avoid friction and the deflection of piston-rods between supports. Four 1-inch steel ropes are fastened to an equalizing bar at the top of the cylinder girders, and after passing back and forth around each sheave of traveler and auxiliary system they lead

off the traveler to the overhead sheaves and thence to the car.

The water-pressure necessary to run the machine, 180 pounds per square inch, is obtained from tanks located near the middle landing, which are kept filled from a pumping system below. The pressure is thus admitted through the valve and circulating-pipe, Fig. 2, to act on the top of the piston, and the discharge being open from the bottom of the cylinder the piston descends, lifting its load. The valve being reversed, the bottom of cylinder connects with circulating-pipe, and the discharge being closed the car descends by its own overbalance, raising the piston and causing the water to circulate from the top of the cylinder down through the circulating-pipe to its original position under the piston; one charge of water thus answering for the complete round trip, which is the regular Otis system.

The cylinder is made of sections of cast-iron pipe 2 inches in thickness. Four 9-foot sections are jointed on the ends and bolted together through the flanges, asbestos gaskets being used between the joints to make them tight. Although 180 pounds is the working pressure, each section was tested to 450 pounds before shipping. In addition to the four 9-foot sections there is a short section at top and bottom where connection is made with the circulating-pipe and water-chest. The cylinder-head has a circle of screw-plugs, which, when removed, permit of the introduction of a long socket wrench by which the piston-packing can be tightened without removing the cylinder-head. On account of the inclined position of the cylinder and its length to avoid the consequent deflection of the piston-rods, which are 5-inch steel and over 40 feet long, supports are introduced both inside and outside of the cylinder. When the piston is at the bottom the inside spider is at the center of the cylinder and the outside spider near the cylinder-head. When the piston has risen to one-half its stroke it picks up the inside spider, which being connected with the outside spider by a rod through the cylinder-head, both are pushed along to the end of the stroke, the outside spider then being the support to the piston-rods at the midway point outside the cylinder. On the down stroke this is just reversed, the traveler at one-half the stroke picking up the outside spider and carrying it back to the cylinder-head, the inside spider being also pushed to its original position. Thus at no time during the stroke are the rods unsupported for a length of over 20 feet. The traveler with its six heavy sheaves weighs in all about 24,000 pounds, and is supported by a truck at each end, as shown in Figs. 3 and 4. A track is provided for these trucks, much the same as for the car trucks, the rails being on the cylinder girders. The position of the traveler at one-half stroke is indicated in the section Fig. 1.

Fig. 5 shows a side elevation of the car frame, with a section of the car, through the aisle and landing projections. The car is a double decker the arrangement in both top and bottom compartment being somewhat similar to an ordinary railway coach, having an aisle with the seats at right angles to it, one back of the other. The cabinet work is simply self-supporting, merely a protecting wall from the elements, and rests in the iron frame, which is designed to take all strains due to lifting or to the check of rapid motion in case the safeties are brought into action and grip the rail. To this iron frame the floor-beams of both decks are braced, upon it the ropes take their hold and in it the safeties are attached. The most peculiar feature of the car is the aisle floor, which projects out in front of the car from both upper and lower stories to meet the landing platforms, which are also double, one above the other, at each landing. This aisle

oor is constructed like a shutter, the position of the slats being under the control of the operator, by the lever indicated in the dotted lines. When the car is at the bottom it is in its most tipped-back position. The lever then being put in the proper slot, each floor slat is horizontal and makes a stairway which the passenger descends to enter the car. At the first floor the lever is placed in the middle slot; the slats are then horizontal, but form an even floor, the position of the car being a mean between its two extremes of inclination. This position is shown in the drawing. When the car is at the middle landing or the top of its ascent it may then be said to be in its most tipped-forward position. The lever being again adjusted, the slats when horizontal form a stairway which the passenger must ascend to enter the car. Thus the change of angle of the car frame is compensated for to effect landings. The seats, however, are stationary, but with such a curve to back and seat that the sitting passenger need experience no inconvenience from the change of inclination. When he takes his seat in the car at the bottom he leans well back. Upon reaching the top he finds his seat more like a straight-backed chair and his body erect.

In the lower part of the iron car-frame, down below the body of the car the safeties are attached, and through them the ropes take their hold as shown in Fig. 6, which is a view of one-half the attachment system looking at right angles to the general plane of the car-frame. It will be seen that six ropes pass from the center to the edges of the frame, three on each side, thence around saddles on the frame and up along each side of the track to the overhead work. Here by a system of sheaves they are collected and redistributed, four ropes, two from each side, passing to the first sheave on the traveler.

The remaining two ropes, one from each side, passing over and under the main car girders lead down to attach to the counter-balance, which is a riveted iron truck, Figs. 7 and 8, running on a track structure similar to main track structure and immediately back of it or below it. This loaded counter-balance frame, being thus directly connected to the car, forms a partial and adjustable balance to the weight of the car, thus decreasing by its gravity the actual load to be lifted by the action of piston in cylinders. The car, however, must not be fully counter-balanced, for as already stated a portion of its weight is necessary to the down trip and the raising of the piston. Owing to the construction of the tower the counter-balance track is but one-third of the length of the car track and does not extend above the first inclination of the grade line, hence the counter-balance frame is so geared as to travel but one foot while the car travels three feet. The weight of counter-balance is necessarily increased in the same proportion to be effective. The weight of the empty car uncounter-balanced, with all its attachments, safeties, &c., is 24,000 pounds; with full load 32,000 pounds. The water pressure is therefore required to overcome all friction, weight of ropes, &c., and lift the live load of 8000 pounds, plus the over-balance of car, at the rate of 400 feet per minute, which illustrates the net working power of the machine. The safeties are an adaptation of the compound wedge safety used on Otis passenger elevators, the action of these wedges when called into operation being to grip the rail, not with full power at once, but with constantly increasing force until the resistance becomes sufficient to overcome the momentum and weight of the car. In the present case these wedges are arranged upon shoes which when not in action clear the rail, the whole mechanism being contained in a riveted iron frame

pivoted to the car-frame at lower end, and supported by governor-wheel at upper end, the governor-wheel running upon the rail, and having a speed due to the velocity of the car. This is indicated in Fig. 5, and Figs. 9 and 10 show two views of safety frames more in detail. The initial power on the first wedge, which starts the compounding action of the wedges, is obtained from springs in car frame, Fig. 6. These springs are released from two causes, (1) the breaking of one or any number of the ropes, and (2) by undue speed from any cause. This latter is affected by the wheel-governor already mentioned, to which there are attached toothed weights. These weights, up to a car speed of 400 feet per minute, remain in the center of the wheel, but greater velocity throws the weights by centrifugal force to the outside rim of the wheel, where their teeth engage the necessary mechanism to release the springs. Figs. 11 and 12 show device for operating hand-rope. This is under the projecting aisle of car,

sons, Clarkson C. in Detroit, Fred F. in Chicago, and Theodore K. in St. Louis. The failure is laid wholly at the door of the Chicago branch. The Detroit house has been well managed and can meet all its liabilities, but the Chicago branch is badly off, and St. Louis is also somewhat behind. The total liabilities are placed at \$130,000, with assets estimated at \$45,000. The Detroit manager asserts positively that he will resume as soon as he can get freed from the present entanglements, and it is highly probable that the St. Louis branch will open again also.

#### The Western Wages Scale.

Advices from Pittsburgh state that there will be no conference this year between the iron manufacturers and the workers on the annual wage scale. This will be the first time in the history of the Amalgamated Association of Iron and Steel Workers, which was organized in 1874,

Association, Mr. Weeks replied that there was no way by which they can get together a committee to represent the Association of Manufacturers of Iron, Steel and Nails, as it is not now in existence. There is nothing now left for the Amalgamated Association to do but formulate its new scale and present it to each firm through the proper committees. Now let every member of the Amalgamated Association keep his own counsel. Do all your business with your firm through the proper committee, and in no other way, and await results.

The members of the Amalgamated Association do not anticipate any trouble this year, notwithstanding the fact that the manufacturers will not confer with them. None of them will venture a prediction as to what demand they will make, but all agree that it can be safely stated that the present scale, with some slight modifications, will be presented. The only hitch will be with the steel scale. The announcement of Carnegie, Phipps & Co. that they will postpone the date fixed for signing the Homestead scale until June 10, in order that the Amalgamated convention may consider it, is an indication

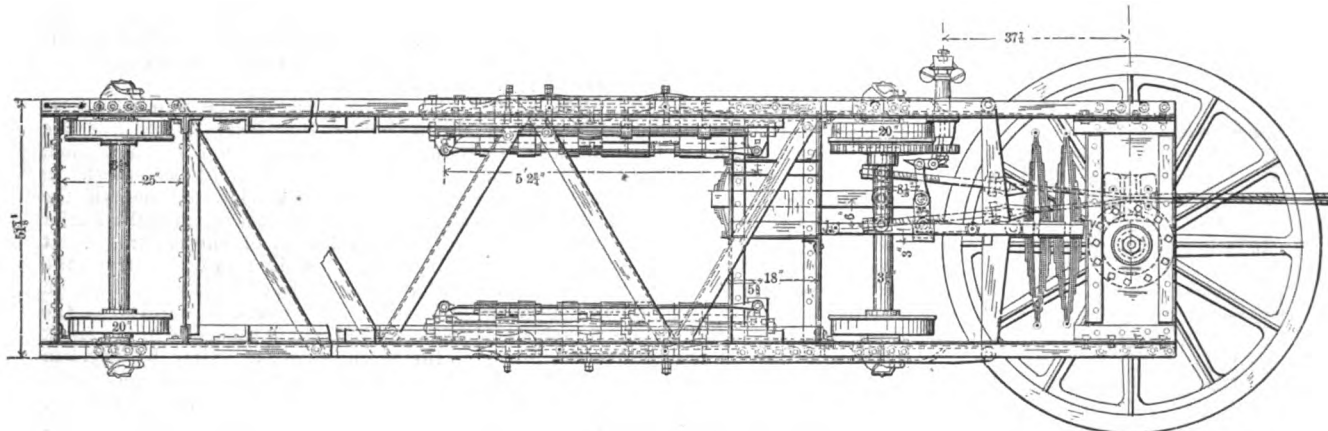


Fig. 7.—Plan View of Counter-Balance

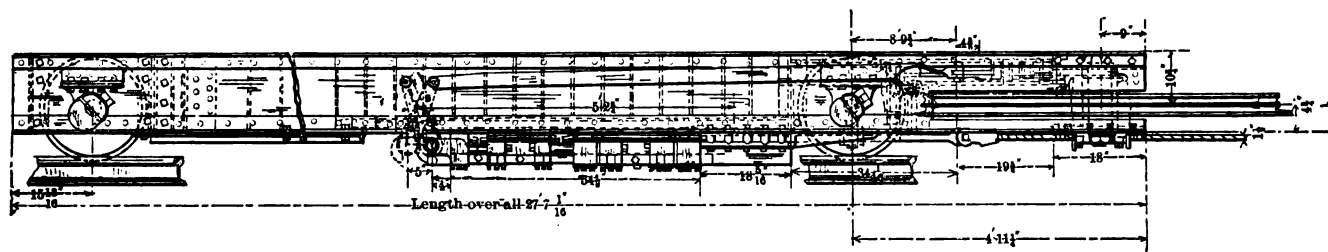


Fig. 8.—Side Elevation of Counter-Balance.

with hand-wheel for operator, as shown in Fig. 5. The operating rope is continuous, and passes around the valve-sheave at foot of cylinder. This valve-sheave is balanced in position by a weight, which, if operating rope should part, would in falling close the valve.

Thomas E. Brown, Jr., chief engineer of Otis Brothers & Co., has devoted the better part of two years to the design, manufacture and erection of these machines, and it is due to his untiring energy that this American company supplied the great tower with these powerful inclines, for which no foreign competitors were able to present, even to their own governments, designs which could be accepted.

The old-established machinery firm of G. S. Wormer & Sons, of Detroit, made an assignment on the 31st ult. A dozen years ago it started branches in Chicago and St. Louis. All three stores are included in the assignment. The firm handled engines, boilers, wood-working machinery, &c., but the St. Louis house made a specialty of engines and heavy mining machinery. The senior partner retired several years ago, and the three houses have been since managed by as many

that a conference has been refused by the manufacturers. In past years the Manufacturers' Association handled all such questions and appointed committees to meet the workers. A. F. Keating was president and Joseph D. Weeks was secretary of the organization. This association, however, went to pieces last year, and when President Weihe, of the Amalgamated Association, addressed a formal note to Secretary Weeks announcing that they were about to draw up a scale of wages for the coming year and would appoint a committee to confer with a like committee of manufacturers, he received a reply from Secretary Weeks that there was no association of manufacturers and no committee could be appointed. There will, therefore, be no conference with the iron masters this year, and the lodges in each mill will present the scale to the different firms. The scale will be uniform, and if any firm objects to a clause in the scale and it is modified all other firms will have the same advantage. Secretary Martin has issued the following to the members of the association:

In reply to the request of President Weihe to the manufacturers, through Mr. Joseph D. Weeks, to name a day when they could meet a conference committee of the Amalgamated

that the firm do not intend to adopt a rough-shod course. This trouble may be satisfactorily settled. If war is declared it is claimed that the workers can stand a siege of eight weeks very comfortably, as the funds in the treasury are larger than usual. The *Labor Tribune*, in commenting on the wage question, editorially says:

There seems to be considerable trouble in the newspapers about the arrangement of the figures of the coming scale year, and it may be that this may extend into the iron and steel industries before the annual signing is done; however, it is hardly within the probabilities that there will be difficulties equal to those that have been in some years in the past. The situation has its main peculiarity in that trade has been so very good in England that wages have been advanced materially, while in America this has not been the case. As might be expected of business men, the mill owners take the opportunity presented by these conditions to endeavor to make a few points on wages and on the terms of labor. There is nothing surprising in this; it would be surprising were they to permit the chance to pass unimproved.

While it is yet a little early to predict the outcome, it is the impression among the manufacturers that a shut-down of the mills for two or three weeks will take place, after which a scale will be agreed upon that will be satisfactory to both manufacturer and workman.



## Cambria Iron and Steel Works.

### Magnitude of the Establishment.

The following description and history of the Cambria Iron Company's works, at Johnstown, Pa., partly destroyed by flood on May 31, is mainly taken from a report prepared by the Pennsylvania Bureau of Industrial Statistics:

The great works operated by the Cambria Iron Company originated in a few widely-separated charcoal furnaces, which were built by pioneer iron-workers in the early years of this century. The company's charter was granted in the year 1852. Johnstown was then a village of 1300 inhabitants. The Pennsylvania Railroad had only been extended thus far in 1852, and the early iron manufacturers rightly foresaw a great future for the industry at this point. Coal, iron and limestone were abundant. In 1853 the construction of four coke furnaces was commenced, and it was two years before the first was completed, while some progress was made on the other three. A mill for rolling iron rails was also built. England was then shipping rails into this country under a low duty, and the iron industry, then in its infancy, was struggling for existence. The furnaces at Johnstown labored under greater difficulties in the years between 1852 and 1861 than can be appreciated at this late day. Had it not been for a few patriotic citizens in Philadelphia, who loaned their credit and means to the company, the city of Johnstown would probably never have been built. Notwithstanding the protecting care of the Philadelphia merchants, the company in Johnstown were unable to continue in business, and suspended in 1864. Among their heaviest creditors in Philadelphia were Oliver Martin and Martin, Morrell & Co. More money was subscribed, but the establishment failed again in 1865. D. J. Morrell, however, formed a new company with new credit.

The year 1856 was one of great financial depression, and the following year was worse. To render the situation still more gloomy, a fire broke out in June, 1857, and in three hours the large mill was a mass of ruins. So great was the energy, determination and financial ability of the new company that in one week after the fire the rolls were once more in operation under a temporary structure. When the war came and with it the Morrill tariff of 1861 a broader field was opened up. Industry and activity in business became general; new life was infused into every enterprise.

### STEEL PLANTS ERECTED.

The Cambria Iron Company began the erection of Bessemer steel works in 1869, and sold their first steel rails in 1871 at the ruling price of \$104 a ton. The history of the company from that time on shows a constant increase in plant. About ten years ago the Gautier Steel Company, Limited, were organized to manufacture, at Johnstown, wire and various other forms of merchant steel. Within less than a mile from the main works extensive mills were erected, and the business soon grew to great proportions. In a few years much additional capital was required, owing to the rapidly-increasing business, and the Cambria Iron Company became the purchaser of the works, now known as the Gautier Steel Department of Cambria Iron Company.

### THE WORKS IN THEIR LATEST DEVELOPMENT.

The blast-furnaces, steel-works and rolling-mills of the company are situated upon what was originally a river flat, where the valley of the Conemaugh expanded somewhat just below the borough of Johns-

town, and now forming part of Millville borough. The arrangement of the works has been necessarily governed by the fact that they have gradually expanded from the original rolling-mill and four old-style blast-furnaces to their present character. The Johnstown furnaces, Nos. 1, 2, 3 and 4, form one complete plant, with stacks 75 feet high, 16 feet diameter of bosh. Nos. 5 and 6 blast-furnaces form together a second plant, with stacks 75 feet high, 19 feet diameter of bosh. The Bessemer plant was the sixth started in the United States (July, 1871). The main building is 102 feet in width by 165 feet in length. The cupolas are six in number. There are two vessels of 8½ tons capacity each, the products being distributed by a hydraulic ladle crane. The best average, although not the very highest work done, in the Bessemer department is 103 heats of 8½ tons each for 24 hours. The best weekly record reached 4847 tons of ingots, the best monthly record 20,304 tons, and the best daily output 900 tons ingots. All grades of steel are made in the converters, from the softest wire and bridge stock to spring steel. All the special stock—that is, other than rails—is carefully analyzed by heats, and the physical properties are determined by a tension test. A new two-vessel Bessemer plant was just completed this spring, and had incorporated in it the very latest improvements and appliances for the manufacture of steel.

The open-hearth building, 120 feet in width by 155 feet in length, contains three Pernot revolving-hearth furnaces of 15 tons capacity each, supplied with natural gas. A separate pit, with a hydraulic ladle crane of 20 tons capacity, is located in front of each pan. In a portion of the mill building, originally used as a puddle mill, is located the bolt and nut works, wherein are made track bolts and machine bolts. This department is equipped with bolt-heading and nut-making machines, cutting, tapping and facing machines, and produces about 1000 kegs of finished track bolts, of 200 pounds each, per month, besides machine bolts. Near this also are located the axle and forging shops, in the old puddle mill building. The axle shop has threesteam hammers to forge and ten machines to cut off, center and turn axles. The capacity of this shop is 100 finished steel axles per day. All axles are toughened and annealed by a patented process, giving the strongest axle possible. In the forging plant, located in the same building, there is an 18,000-pound Bement hammer and a 10-ton traveling crane to convey forgings from the furnaces to the hammer. There are two furnaces for heating large ingots and blooms for forgings. The blooming-mill contains two large blooming trains and eight Siemens heating-furnaces. The rail mill has six trains and ten heating-furnaces. The mill plant also comprises a wire-rod mill, making 80,000 pounds each turn. A ventilating fan supplies fresh air to the mills through pipes located overhead and having outlets near the heating-furnaces. One hundred thousand cubic feet of fresh air per minute is distributed throughout the mills. The mill has in addition to its boilers over the heating-furnaces a brick and iron building, located near the rail mill, 205 feet long and 45 feet wide, containing 24 tubular boilers, aggregating about 2000 horsepower.

The Gautier Steel Department, situated in another part of the town, consists of a brick building 200 x 500 feet, where the wire is annealed, drawn and finished; a brick warehouse 373 x 43 feet; many shops, offices, &c.; the barb-wire mill, 50 x 256 feet, where the Cambria link barb wire is made, and the main merchant mill, 725 x 250 feet. These mills produce wire, shafting, springs, plow-share, rake and harrow teeth and other kinds of agricult-

ural-implement steel. In 1887 they produced 50,000 tons of this material, which was marketed mainly in the Western States. Grouped with the principal mills are the foundries, pattern and other shops, drafting offices, time offices, &c., all structures being of firm and substantial character. The company operate about 85 miles of railroad tracks, employing in this service 24 locomotives, and they own 1500 cars. In the fall of 1886 natural gas was introduced in the works.

### OTHER ENTERPRISES UNDERTAKEN.

Anxious to secure employment for the daughters and widows of the employees of the company who were willing to work, the management erected a woolen mill which now employs about 300 persons. Amusements were not neglected, and the people of Johnstown are indebted to the company for the erection of an opera-house, where dramatic entertainments are given.

The company own 700 houses, which are rented exclusively to employees. The handsome library erected by the company and presented to the town was stocked with nearly 7000 volumes. The Cambria Hospital is also under the control of the beneficial association of the works. The Cambria Club-house is a very neat pressed-brick building on the corner of Main and Federal streets. It was first opened in 1881, and is used exclusively for the entertainment of the guests of the company and such of their employees as can be accommodated. The store building is a four-story brick structure on Washington street, with three large store-rooms on the first floor, the remainder of the building being used for various forms of merchandise. Including the surrounding boroughs, all of which are built up solidly to Johnstown proper, the population is about 30,000. The Cambria Iron Company employ, in Johnstown, about 7500 people, which would certainly indicate a population of not less than 20,000 depending upon the company for a livelihood. A large proportion of the population of Johnstown are citizens of foreign birth or their immediate descendants. Those of German, Irish, Welsh and English birth or extraction predominate, with a few Swedes and Frenchmen. As a rule the working people and their families are well dressed and orderly; in this they are above the average. Most of the older workmen of the company, owing largely to their liberal policy, own their houses, and many of them have houses for rent.

### THE PARTIAL DESTRUCTION OF THE WORKS BY FLOOD.

Having passed through financial reverses, overcome losses by fire and reached a most important position in the industrial world, the company have now encountered the severest check to their prosperity in the damage wrought by the flood of May 31. The latest telegraphic dispatches state that the Gautier Steel Department has been completely wiped out of existence and that the Cambria Works proper have been very seriously damaged. The extent of the damage will not be known for some time, but a very large outlay of capital will undoubtedly be required to put these works in running condition, while the Gautier Department will have to be wholly rebuilt. The company announce that operations will be resumed as quickly as possible. They are fortunate in having assets largely beyond their investments at Johnstown. The greatest loss which they suffer is really in the loss of officers and men who have devoted their lives to the prosperity of the company.

The Buffinton steel works, at Burlington, Iowa, were destroyed by fire on the 29th ult. Loss, \$50,000; insurance, \$27,000. The works employed about 100 men.

### Bits of Engine-Room Experience.\*

About the middle of the year 1888 I had charge of a Buckeye engine, in which a mysterious pounding noise one day appeared. It proved upon examination to be in the cylinder, and was caused by the packing rings striking against a shoulder which had been worn at each end of the bore. How this occurred will be quite clear from an inspection of Fig. 1, which

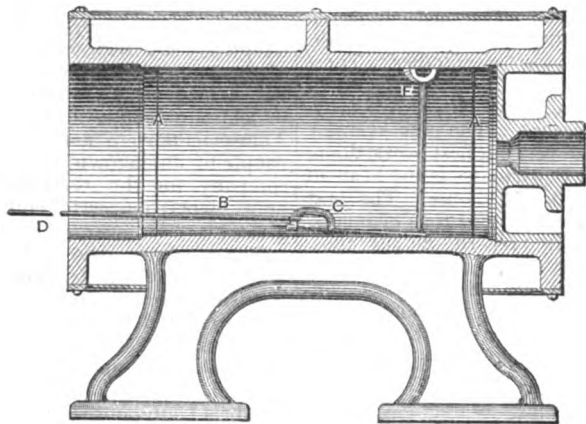


Fig. 1.—Longitudinal Section of Cylinder.

represents a longitudinal section of the cylinder of an 18 x 36 inch Buckeye engine. The shoulder is represented at AA, and it was formed in this wise: The piston-packing was of the type shown in Fig. 2, where A represents a cross section of the cylinder and B the piston. The two piston-packing rings were cut to

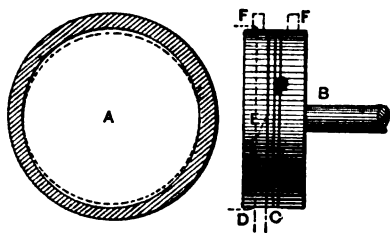


Fig. 2.—Piston Packing.

break joints, and occupied a groove  $\frac{1}{4}$ -inch wide in the center of the piston, as shown at C. It will be seen at once that these rings do not travel the entire length of the bore, but stop in this case  $1\frac{1}{2}$  inches short at each end, as shown by the dotted line D.

From the center E upward this shoulder was worn quite sharp, while from E downward the shoulder was less marked, for the reason that the piston wore the bottom of the cylinder, as shown by the dotted line extending from E downward. An exaggerated case is shown by the dotted lines in the cross section of cylinder, A. The Buckeye Company, I am glad to learn, have abandoned this style of packing, and now use spring rings similar to those that I put in place of the kind removed. These rings were  $\frac{1}{4}$ -inch square, and traveled over each end of the bore  $\frac{1}{4}$  inch, as shown by the dotted lines FF. To put this packing in the shoulder shown at AA had to be removed. It was a comparatively easy matter to file off the shoulder at the back end when the head was removed; but to file off a belt of cast iron  $1\frac{1}{4}$  inches wide,  $\frac{3}{4}$  inch thick and 56.70 inches long in the crank end of an 18 x 36 inch cylinder is not such an easy job. This engine had to run every night, starting at 4.30 p.m.

\* Paper read by Lewis F. Lyne, of New York City, at the Erie meeting of the American Society of Mechanical Engineers.

and stopping at 6.30 a.m.; so it will be understood that the cylinder did not have time to cool sufficiently to make the interior a very desirable place to work in. The way we did it was this: A rod, B, of  $\frac{1}{4}$ -inch round iron was provided with an eye turned on one end, to slip over the offset file-handle C, generally used by machinists for filing flat surfaces. This rod was left sufficiently long to reach outside the cylinder, as shown, so that a workman

standing close to the end of the cylinder, at D, could work the 14-inch bastard file which was used on this occasion.

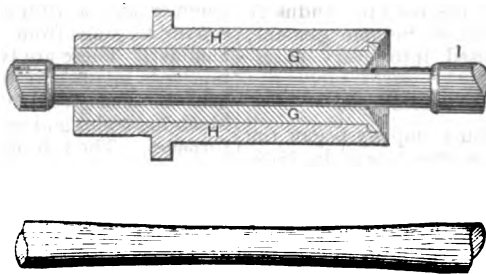
I used what is known as a safe-edge file, on account of its having a broad end, thus giving more surface for cutting. I had an old rubber spring which was cut in two; then with a tenpenny nail one half of this spring was fastened to the end of a broomstick, as shown at E. The broomstick was sawed of a proper length, so that when placed across the cylinder inside a sufficient pressure could be thrown upon the end of the file. We were now ready for business, so a sperm candle was placed in a  $\frac{3}{4}$ -inch hexagonal nut, and after being lighted was placed close to the head of the cylinder. A rubber hose was attached to a common bellows, and supplied fresh air through the stuffing-box. In just two and a half hours from the time of commencement the shoulder at this end of the cylinder was removed.

While I am on this subject I cannot refrain from condemning all forms of piston-

cylinders so that shoulders could be worn at the ends. I mean this to apply to pumps of all descriptions and air compressors, as well as to steam-engines; for I have met and remedied this same difficulty time and again in overhauling various kinds of machinery. I remember on one occasion, where the cross-head gibs on a certain steam-engine were adjusted when the piston stood at half stroke, there was a shoulder worn on each end of the guides, so that when the engine started the cross-head was split open when it reached the shoulders. So it will be seen that this principle applies not only to cylinders, but to guides as well. In short, where there is reciprocating motion great care should be taken to have the gibs or slides wipe over to prevent the formation of shoulders. To be sure, such instances are becoming more rare on account of the better diffusion of practical knowledge through our technical schools; but there are hundreds of steam-engines and pumps where these shoulders should be taken off and recesses cut in their places.

### VALVE-STEMS.

A common mistake is made in turning valve-stems of a uniform diameter throughout, so that, after they have been in use a year or so, one has to either throw away the stem and get a new one or resort to some such wrinkle as I am about to describe. The valve-stem, as it wears, assumes the form shown in Fig. 4, so that it is entirely out of the question to keep it tight, except at each end of the stroke, where it jams so tightly that one is in danger of tearing some of the valve-motion apart. I once knew a locomotive rock-arm to be sprung  $\frac{1}{8}$  inch out of its original shape by screwing the packing too tight on a badly worn valve-stem. A valve-stem of the kind first described became badly worn upon an engine under my direction, and its shape very much resembled Fig. 4; so I put it in a lathe and trued it up, letting the cut run about 2 inches each end beyond the point where stem would travel when in use. The job was to get a gland and junk-ring on that stem so that they would fit. This is how it was done: A brass bushing was sawed through longitudinally, and the joint filed to a fit. I then with soft-solder sweated them together, using the slightest quantity of solder. I then bored this bushing to fit the stem, and turned it to easily fit the



Figs. 3 and 4.—Valve Stems.

packings that do not wipe over the entire ends of the bore, to avoid the slightest possibility of wearing a shoulder. I remember an instance that happened on a tugboat in 1882, where a 20-inch cylinder was split the entire length because the piston-ring swedged against a shoulder worn at the end of the bore. The engineer had been taking up the main-rod brasses the day before, and in so doing the rod was lengthened so that the packing-rings, which were of the old-fashioned spring type, being stuck fast, split the cylinder as described. If the rings travel over the end into the counterbore there is no possibility of such an accident. I never could ascertain why any engineer could design

original junk-ring, which had been previously bored out and recessed, as shown in Fig. 4.

When finished the bushing was warmed to melt the solder, when it fell apart. I then slipped the ring H over the valve-stem I, and placed the two parts of the bushing G in place. It will of course be understood that when in the stuffing-box the packing will prevent this bushing from moving, so that for all practical purposes it is as good as if it were all solid. The ring J which fits in the bottom of the stuffing-box is made in the same manner as that of G, except when put on the stem a drop of solder is used to join it; but when once inside the stuffing-box it does

not matter whether it is in two pieces or one.

The practice of making the threads on the ends of piston-rods of equal diameter with the rest of the rod ought to be condemned for several reasons. The principal one is that the rod cannot be trued up and used without resorting to a split gland bushing; and when metallic packing is used it is necessary to remove that packing whenever the piston-rod is taken out of the cylinder. The reason is that the threads on the end of the piston-rod would tear it all to pieces in drawing it back through the stuffing-box. If the thread were of a smaller diameter than the body of the rod, as it should always be, then there would be no necessity of disturbing the packing, and the rod could be trued and replaced, requiring only a plain bushing for gland and for junk-ring.

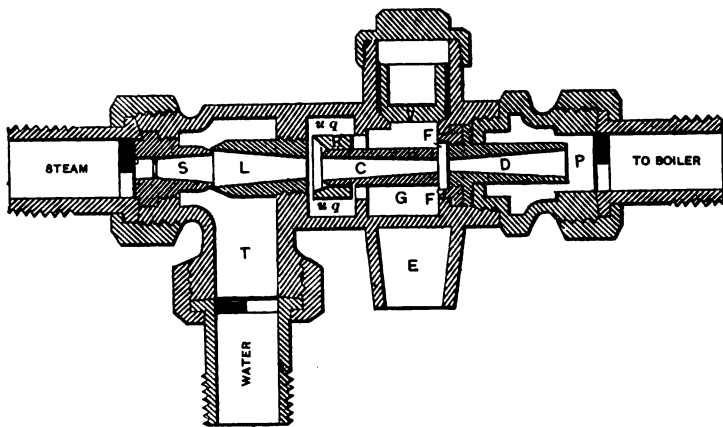
#### RENEWING ENGINE BED.

The above engine, when first set up, rested on a bed of sulphur, which after a time began to disintegrate and work out. Mr. Lyne's method of remedying this evil was simple and effective: "Four pieces of flat iron,  $\frac{1}{4}$  x 4 inches, were cut off. These we reduced in thickness so as to just fill the space between the top of the cap-stones and the cylinder feet. We

forming the dam preventing the metal from running out at the sides. No one who has seen it doubts that this cylinder is fixed forever."

#### Automatic Injector.

The automatic injector of which we herewith present an engraving has few working parts and is extremely simple in operation. Steam enters through the jet S, passes into the chamber G through the jet L, causing the auxiliary check R to slide along the tube C; the steam, lifting the valve V, passes out freely through the overflow E, drawing the air out of the chamber T, in which a vacuum is created that lifts the water from a lower level. As soon as the water reaches the chamber T the steam is condensed and a velocity imparted to the water, which passes on into the chamber G, and as the velocity increases passes through the tube C and spills through the openings F F, forcing the auxiliary check R back on the tube C. When it reaches the projections q q the vacuum carries it on by the same to its original position, as shown in the drawing. As soon as the water attains sufficient velocity to overcome the boiler pressure it passes on through the tube D, thereby



THE METROPOLITAN AUTOMATIC INJECTOR.

dug out the sulphur by the side of each anchor bolt, of which there were four, two in each foot; we slacked the nuts of the foundation bolts, then put in the liners, one for each bolt, and screwed them fast. The sulphur was then removed from one foot at a time, and the space thoroughly scraped out. We then took two strips of lath and wrapped sufficient paper around each of them to fill the space between the stone and foot, thus dividing the space into three equal parts. This was done because it would take more metal to fill the space than could have been conveniently handled. We placed strips of laths edgewise all around the foot and backed them with fire-clay. An opening was left at each of the four corners—two for risers and two diagonal corners for pouring metal, leaving a head of about 2 inches, to better insure a solid casting. Some powdered resin was thrown into the gates to absorb the moisture and prevent the casting from blowing. Having previously melted in an iron pot a mixture composed of nine parts of lead, two of antimony and one of bismuth (commonly known as expansion metal), we poured from two ladles, and in about ten minutes had the satisfaction of finding that our cylinder was as securely held as if it had been originally bedded on the solid stone. We poured the outer spaces of each foot first, then removed the two strips of lath and poured the middle space, the two outside castings

causing a vacuum in the chamber G, which closes the valve V. When the machine is working there is a direct communication between the secondary spill F F and primary overflow through the ports u u on the auxiliary check R, which enables the injector to work very hot water. In starting the injector the passage between the primary and secondary overflows is automatically closed for an instant, then automatically opened when the injector is working. The steam-supply pipe and the suction-pipe are provided each with a valve to regulate the flow of steam and water respectively. A valve is also placed on the delivery-pipe. It will be seen that while the parts are few and easy of access the injector is automatic and reliable in its action. This injector is the invention of John Desmond, and is manufactured for Jenkins Brothers, of New York, Boston, Chicago and Philadelphia.

#### Proposed New Steamship Line.

Western men are interesting themselves in a proposed steamship line from Tampa Bay to Aspinwall, designed to promote direct trade between Southern points and the West at the expense of New York. A memorial, signed by members of the St. Louis Merchant's Exchange, cites the fact that it has been shown that many millions of dollars can be saved to the people of the Western, Middle and Southern States on goods from Cuba, Central America,

South America and Mexico that now come by the way of New York and the Atlantic seaboard, passing out of the Gulf of Mexico and the Caribbean Sea through the dangerous reefs of Florida and by Cape Hatteras to reach New York, entailing an extra insurance of 24 per cent., and a loss on vessels of \$10,000,000 yearly, saying nothing of the \$1,500,000 loss per year on perishable goods by long shipment. It has also been shown that \$265,000,000 worth of commerce passes and repasses yearly to the Eastern seaboard over this dangerous route, and that out of this amount \$165,000,000 worth is consumed, handled and manufactured west of and including the State of Ohio. Attention is then called to the advantages of Tampa Bay as a harbor, and to the fact that by making use of it all this heavy loss and increased cost of insurance can be saved to the consumer, and at the same time a large volume of business can be given to the Southern and Western roads in carrying these goods direct to St. Louis, Chicago and Cincinnati, the neutral inland markets of the country. Congress is asked for \$1,000,000 in aid of the scheme.

#### A New Sound Steamer.

The Providence and Stonington Line have added another handsome steamer to their already large fleet. The new boat has been christened the Connecticut. She was built at the yard of Robert Palmer & Sons, at Noank, Conn., and is in every way a fine piece of marine architecture. In many material respects she differs from all other steamers plying on Long Island Sound. Her principal dimensions are: Length over all, 357 feet; length on 11-foot load-line, 345 feet; beam outside of hull planking, 48 feet; extreme width over guards, 87 feet; depth of hull, 17 feet 8 inches; extreme depth forward, 26 feet; extreme depth aft, 20 feet; extreme height from bottom of keel to top of pilot-house, 60 feet. The bow lines are 171 feet long, about half her length, then a short parallel body, then the stern lines, which are sharper than ever seen in other boats of this class. By this arrangement the center of displacement is so far forward that all freight may be stowed forward of the main deck saloon. The engines are about 40 per cent. lighter than the ordinary beam engines of same power, and were built by the Wm. Cramp & Sons Ship and Engine Building Company, of Philadelphia, Pa. The engines are of the type known as double expansion, compound, inclined, direct-acting, surface condensing oscillators, with cylinders 56 inches and 104 inches diameter and 11 feet stroke of pistons. She also has feathering paddles, two air-pumps, four feed-pumps and two bilge-pumps, worked by independent compound engine, and an independent surface condenser fitted to work with all pumps, dynamos and donkey-engines. Steam is supplied by six boilers, 12 feet 6 inches diameter, 20 feet 8 inches long, set fore-and-aft in two nests of the boilers each, having athwartship fire-rooms at extreme ends. The boilers are of steel, built to carry 120 pounds of steam, and have two smoke-pipes placed fore-and-aft, 8 feet 6 inches outside diameter. When working full power, with engines making 30 revolutions per minute, this machinery is expected to develop nearly 6000 horse-power. To do this the vessel will be fitted with two blowers, each having a capacity of 40,000 cubic feet of air per minute, which will be used for forcing fires. The total weight of this machinery, including water in boilers, will be about 1000 tons. The vessel is expected to make 20 miles an hour when working full power.

### An Important Railroad Decision.

The decision of the Executive Board of the Interstate Commerce Railway Association, on the request of the Alton and Burlington railroad companies for a reduction of the lumber rate from Chicago to the Missouri River, was made public on the 28th ult. by Chairman Walker. The decision is an extremely voluminous one, and refuses the request for the reduced rate. The summing up is as follows:

"We do not feel justified in authorizing the Chicago and Alton and Chicago, Burlington and Quincy companies to make the proposed reduction to 10 cents per 100 pounds. Such a step would greatly disturb the lumber rates of all the lines and would almost inevitably result in great loss, even to some which are not involved directly in the controversy. It would probably be met by reductions on the part of the Southern lines which could not be confidentially affirmed to be altogether unjust. It would no doubt for a time afford increased tonnage to the roads which are seeking it, but the tonnage without profits is of no value except for advertising and statistical purposes, and to inflict direct losses upon the income of associated lines for the purpose merely of making an exhibit of enlarged tonnage when no net revenue above expenses is in sight would be consistent neither with the principles of this association nor with ordinary consideration for the rights of others.

"The proposed 10-cent rate would practically be a war rate, and only justifiable as such. It is the part of wisdom to count the cost before taking the sword. A conflict is proposed which may entail losses upon the various contestants amounting to millions of dollars. The Executive Board regards the proposed 10-cent rate as one which is not justified by existing circumstances, which would be of no practical or substantial advantage to the roads which ask it, which would invite immediate reductions by the Southern roads and thus would neutralize itself and which would work great injury to other lines in this association. The finding, therefore, is that the rate cannot properly be authorized."

The decision, as a whole, is probably the most important ever delivered concerning Western roads. The whole question is thoroughly gone into, both sides being fully stated. As representing the effect of Interstate Commerce Commission training on Chairman Walker, the following paragraph is significant:

"No common carrier can be justified in engaging in a general rate war to punish an adversary or to redress a wrong. In so doing it not only sacrifices the immediate income of its own stockholders and the interests of all for whom its administration is directly conducted, but also inflicts great injury upon the public at large, which finds its business plans and enterprises thrown into confusion, the prices of the commodities unsettled and eventually in one way or another is called upon to pay the bill. The employment of retaliatory methods is no longer admissible. The country is aroused to the wrongs that they involve, both to railway owners and to shippers. If the farmers cannot stop them it is obvious that the State must interfere."

It now remains to be seen whether the companies interested will abide by this decision or not. If they do, it will be a decided guarantee in favor of harmonious action in the future.

Professor Friend was the mechanical expert in constructing machinery for the alleged bogus electric sugar process and possessed all the secrets. How to maintain this secrecy in giving out contracts for the job was a source of much embarrassment. W. H. Cotterell, ex-president of the company, in his testimony be-

fore Recorder Smyth, said: "The professor hit upon a novel plan to impress the company with the secrecy which was to be maintained in the manufacture of the machinery. For this purpose he wrote an affidavit, which he had photographed, and which he said that every workman employed to make the secret machinery would have to swear to. This affidavit was very lengthy and bound the workman never to reveal to any one, not even his employer or his wife, the character of the work he was engaged at, or the person for whom it was done, or the object of it. A copy of one of these remarkable affidavits was shown the jury. Friend further told the company that this secret machinery, to avoid any possibility of its nature being discovered, was made in pieces in various parts of the country, and the parts were all shipped to him. Of course their manufacture was expensive, and this occasioned his constant demands for money."

### The Verrugas Viaduct Destroyed.

Writing under date of March 28 from Lima a correspondent says:

"Since the termination of the war with Chili no such misfortune has happened to Peru as the recent and unexpected destruction of the Verrugas Viaduct, on the Moya Railway, at a point 40 miles from Lima, and connecting the coast with the vastly wealthy interior. On Saturday afternoon last a water cloud suspended over one of the lofty mountains covering the bridge broke, and an immense column of water was precipitated on the hill, carrying with it in its downward course huge boulders and granite rocks, which were hurled against the center column of the viaduct, destroying it completely, and causing the remainder of the structure to fall, owing to the surrender of the base. The ruin was complete, and the whole work of destruction did not occupy ten minutes. The Verrugas Viaduct was built at Baltimore in 1874, at a cost of \$500,000, and put in position the same year. It measured 575 feet in length and was 260 feet in height, making it the highest structure of the kind known save one since erected in the United States. Its lines were graceful, and engineers and scientific men from all parts of the world came to admire and acknowledge it as an engineering triumph. To talk now of repairing it is out of the question; the Government is penniless, and the contractor cannot be called upon to incur the expense, any more than a man occupying a house destroyed by fire, independent of his will, could be. How the resources for rebuilding—nearly \$1,000,000—are to be found is a problem not yet solved. Not only the material work of interruption is to be deplored, but the markets of Lima and Callao will be deprived of their customary supplies, and the cost of all the necessities of life, now so exaggerated, will rise to a fabulous price. The enormous amount of ore formerly carried over the road must now seek the antiquated method of mule-back, so increasing the measure of freight as to render it practically valueless. The great establishment of Messrs. Bockers & Johnston, recently erected to consolidate base ores at a large expenditure, is rendered comparatively useless, and the great furnishing houses at Lima are left without their customary buyers. The interior will be deprived of all its supplies, and mining enterprise, so progressive in this section, is for the time being fairly ruined. What is of equal consequence is the effect the disaster will have on the Donoughmore contract. The hopes of the bondholders were mainly centered on this line, which promised to be lucrative in earnings, and the sudden collapse of an indispensable adjunct will lead them probably to retire their proposal. No other means of com-

munication save that dilatory and costly one of mule and llama back exists with the interior, and even this to a small extent, owing to the withdrawal of such traffic by the facilities of the railway. The event is really regarded as a national calamity, and well may it be so."

Under date of April 4 the same correspondent writes: "Among the new theories started regarding the destruction of the Verrugas Viaduct is that it was suddenly overpowered by a lightning flash, and this is sustained by the sulphurous odor attached to all parts of the debris. Engineers are still busily engaged in their investigation, and the first reports of damages have resulted to be extremely exaggerated. Mr. Grace has signified his intention of furnishing the money required for the rebuilding of the structure, but it will require nearly a year before it can be completed. Meantime the vast mining interests in the interior are severely suffering, the ores being rendered stationary, and the articles of food brought down formerly to Lima have increased threefold in their prices. The market for goods from the coast is also ruined, and the evils resulting from the disaster are becoming greater every day."

### Wire Nails vs. Cut Nails.

The *Wheeling Intelligencer* talks very plainly to the manufacturers of the Nail City, as follows:

The reason of the growing popularity of the wire nail has not been a secret. On the contrary, everybody has known that the explanation consisted largely in the fact that those who made them gave the consumers of nails from one-third to one-half more nails to the pound. Was this fact not something of great importance to cut-nail manufacturers? Should it not have been recognized ere this? The fact that it has not been recognized would seem to indicate to the public one of two things, either that cut nails cannot compete in this respect with wire nails, or else that the makers of them find it more profitable to go on selling the old-fashioned heavy nails. That they have not found it profitable to do so needs no proof at our hands. The declining price for nail stocks tells the story of itself. If, then, the cut nail could have been kept more popular with the public than it is to-day, but has not been so kept, it is plain that those who have been in charge of the vast interest embraced in their production are justly responsible to their stockholders for the present state of affairs.

The question arises as to what point the losing business of the past five years is going to be carried before stockholders will come to the front and take charge of their interests. Will it be when the stock of the majority of the mills quotes at 50 cents on the dollar? Some of them are nearing that point now. Or will a halt be called at the instance of those who have so much at stake and who recognize a necessity for two essential changes—viz.: first, to check the overproduction of a nail that does not meet the competition of the wire nail, and, next, to make a nail that promises to meet that competition with at least a greater degree of success than the present article?

The Chicago, Burlington and Quincy Railroad and competing line from Chicago have announced a new classification on iron, steel and rails from Chicago to St. Paul and Minneapolis. Commencing with Saturday, the 1st inst., these articles took sixth and fifth class rates on carloads and less. The rates now are, for car lots, 11 cents, less than car lots, 12½ cents, a reduction of 3 cents on the first and 4½ cents on the last named.



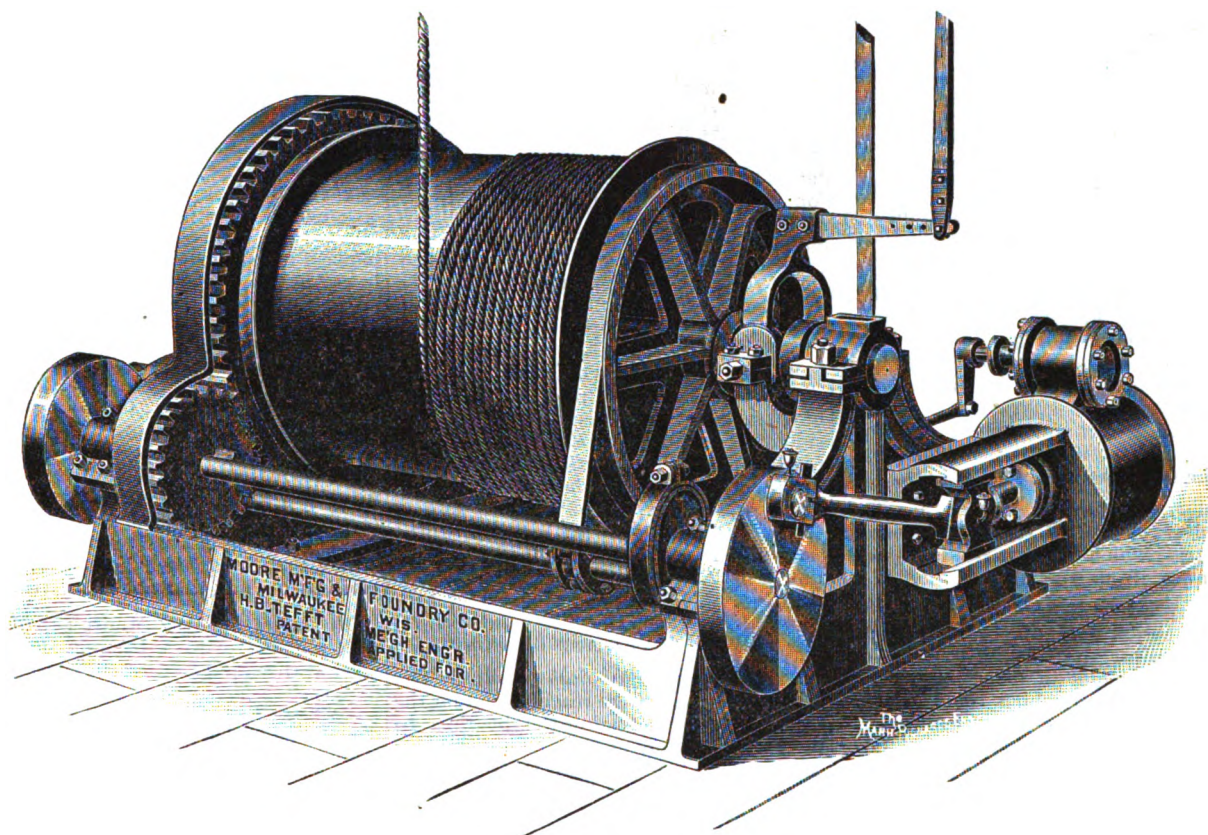
**Hoisting-Engine.**

The Tefft paper friction hoisting-engine, of which an engraving is here presented, is a new machine made by the Moore Mfg. and Foundry Company, of Milwaukee, Wis., and especially adapted for coal and ore hoisting, pile-driving, mining, &c. The form of the engine and the method of gearing and mounting the machine are plainly shown in the cut. By a simple movement of the friction-lever the speed can be regulated and the load raised steadily and uniformly at any desired speed, from nothing up to the limit at which the machine may be running. By the use of the brake-lever and the mechanism it controls the load can be held at any point. The engines are made with double  $8\frac{1}{2} \times 10$  or  $6\frac{1}{2} \times 10$  inch cylinders, set to quarter-stroke, with rocker-valves and straight-line frames. The

and the Mississippi River, except St. Paul and Minneapolis.

The new rail and lake rates to St. Paul and Minneapolis will be 17 and 21 $\frac{1}{2}$  cents, a reduction of about 5 cents on the all-rail rate. The inside history of this big iron and steel cut is quite interesting. The immediate cause of the present reduction was the cut made a few days ago by the Nypano from Youngstown to Chicago, and of course the other lines had to follow suit. The Nypano reduced the rate on manufactured articles of iron and steel from Youngstown to Chicago from 13 and 15 cents to 10 and 13 cents. Heavy pressure had been brought to bear on the Nypano and Lake Shore roads for some time by the Mahoning and Shenango iron manufacturers for a reduction of rates. The Nypano is not in the Central Traffic Association, but usually acts with that organization. About a month ago the val-

**Our Shipping Interests.**—Hon. Nelson Dingley, of Maine, the recognized leader of shipping legislation in Congress for several years past, has written an article for one of our popular reviews disclosing the policy that will be strongly urged for acceptance during the coming session. The measures to which Mr. Dingley gives his unreserved approval may be outlined as follows: The Government should begin by encouraging the enlargement of old ship-yards and the establishment of new ones on the Atlantic, Pacific and Gulf coasts and on the great lakes. The Government should pay a liberal construction bounty to encourage the building of iron and steel steamships for the foreign trade, on the theory that they may be available for naval service in case of war. The Government should pay liberal mail subsidies for faster and more frequent trips of existing lines, and the establishment of



THE TEFFT PAPER FRICTION HOISTING-ENGINE.

drums, without the engines, can be operated by belt or rope or by placing the pinion directly on a line shaft.

**Cut In Western Freight Rates.**

One of the biggest cuts in west-bound rates on articles of iron and steel manufacture in the history of railroads is reported to have been made by freight agents at Pittsburgh on the 1st inst. Only once before, about eight years ago, when the iron rate to Chicago for a few days was 12 $\frac{1}{2}$  cents, were the rates ever as low as they will be on June 8, when this latest cut will go into effect.

The present rates on iron and steel articles from Pittsburgh to Chicago are 17 $\frac{1}{2}$  and 15 cents in less than car and carloads respectively. The new rates will be 14 and 11 cents. The rates to East St. Louis will be 17 and 13 $\frac{1}{2}$  cents, 16 and 13 cents to Milwaukee, 24 $\frac{1}{2}$  and 19 $\frac{1}{2}$  to the Mississippi River points, Burlington, Rock Island and Davenport; 10 and 8 cents to Buffalo, &c. The cut applies west-bound to all the points between the Pittsburgh territory

and the Mississippi River, except St. Paul and Minneapolis. The new rail and lake rates to St. Paul and Minneapolis will be 17 and 21 $\frac{1}{2}$  cents, a reduction of about 5 cents on the all-rail rate. The inside history of this big iron and steel cut is quite interesting. The immediate cause of the present reduction was the cut made a few days ago by the Nypano from Youngstown to Chicago, and of course the other lines had to follow suit. The Nypano reduced the rate on manufactured articles of iron and steel from Youngstown to Chicago from 13 and 15 cents to 10 and 13 cents. Heavy pressure had been brought to bear on the Nypano and Lake Shore roads for some time by the Mahoning and Shenango iron manufacturers for a reduction of rates. The Nypano is not in the Central Traffic Association, but usually acts with that organization. About a month ago the val-

ley roads in the Central Traffic Association recommended to that body that a reduction be made, but the other lines refused and the matter was dropped. Afterward the Nypano, acting on its own responsibility, made the cut, which has become general.

The railroad men will not admit that the appeals and vigorous protests of Mr. Carnegie had anything to do with bringing about the reduction. They attribute the glory to the Mahoning and Shenango valley iron men, who induced the Nypano to make the cut.

This cut was wholly unanticipated in many quarters, the most prominent railroad men of the West having until very recently insisted that no reduction of rates would be made.

Another reduction in freight rates from Pittsburgh to El Paso, Texas, was made on the 1st inst. The reduction amounts to from 8 to 15 per cent., and the new figures are as follows: First class, \$2.23; second, \$1.96; third, \$1.73; fourth, \$1.53; fifth, \$1.25; class A, \$1.33; B, \$1.20; C, \$1.02; D, 80 cents; E, 70 cents per 100 pounds.

new lines specially to Central and South America and the East. The Government should adopt the French bounty system and establish a scale of navigation bounties, to be paid through a series of years to vessels engaged in the foreign trade, these bounties being large enough to cover the computed difference in running expenses between American vessels and the foreign vessels with which they must compete.

Operations will begin within the next ten days on a new Pittsburgh natural gas line that will be to some extent a competitor of the Philadelphia lines. It is to be built by the Oliver Iron and Steel Company and the Republic Iron Works. It will extend from Belle Vernon, a distance of 22 miles, and is to be a 16-inch main. The contract for the wrought-iron pipe has been let to the National Tube Works and will cost about \$12,000 a mile. The cost of laying it will be \$5000 a mile, making the total cost of constructing the line about \$500,000. The territory it taps is one of the richest in Western Pennsylvania and the builders of the line own large leases.

## THE WEEK.

Dispatches from Oklahoma report the finding of rich iron mines a short distance from Guthrie. A shaft will be sunk at once and a thorough examination of the deposit made.

A New Zealand letter says the present year is a phenomenal one, both in respect to Australia's famine and New Zealand's plenty. A recently published official statement shows that the yield of wheat to the acre in New South Wales this year is  $15\frac{1}{2}$  bushels; that of New Zealand is nearly 30 bushels. The total yield of New South Wales is about 1,500,000 bushels, a deficiency of some 3,750,000 bushels on the average of the last 27 years. As the requirements of the colony are over 8,000,000 bushels, and as Victoria, South Australia and Queensland cannot more than supply their own needs—and probably not that—the immense deficit of New South Wales must be made up by New Zealand. This the colony can easily do.

The Navy Department has determined to equip each of our naval vessels with a complete diving apparatus, thus profiting from experience in the Samoa hurricane.

Philadelphia harbor will be improved at a cost of \$200,000, already appropriated by the State.

Plans have been filed in the Building Bureau for the Farmers' Loan and Trust Company's new building. It will be an eight-story limestone-front office building, on the northeast corner of William and Beaver streets, this city. It will have a frontage of 92 feet and a depth of 70 feet. The roof will be fire-proof and of brick, and the structure will cost \$425,000.

English operators are making an effort to recover control of the distribution of China teas, which has been gradually slipping away from them for a number of years.

In the action brought by R. L. Montgomery against the steamship Port Adelaide, for damages in being required to bring the teas with which the steamship was loaded from a Brooklyn instead of a New York pier, where the Port Adelaide should have discharged, Judge Browne, in the United States District Court for New York, on Friday, decided that where a vessel departs from the usual custom in discharging her cargo the owners must be compensated for the additional cost of cartage.

Secretary Windom has rejected the site for new Appraisers' stores in New York selected by Secretary Fairchild, and is now considering the desirability of other sites. The appropriation available is \$800,000.

Architectural plans for the new World building on file in this city contemplate the erection of a structure 13 stories high, the materials to be brick, stone and terracotta. The ground dimensions are 115 x 136 feet, and the cost will be \$1,000,000. From the street level to the roof will be 188 feet.

A new steel cross-tail has been received at the Brooklyn Navy Yard for the steel cruiser Atlanta. On the return of the cruiser from her recent cruise in the West Indies it was found that the cross-tail in place was severely ruptured, there being no less than five cracks, one of which was fully 5 inches in length.

Tons and tons of honey are produced in California, and the export trade in this article is constantly extending. The California Fruit Grower says that from the 50,000 or 60,000 stands or hives in California for the year 1888 there was mar-

keted of extracted honey 3,000,000 pounds and of comb honey 500,000 pounds, or a total of 3,500,000 pounds for the season. The shipments to Europe have increased. They amounted to nearly 1,000,000 pounds of last year's crop. The greater portion of these shipments went direct to England; the balance to Germany.

The British steamship Hawkhurst, with a general cargo, steamed 2300 miles during 11 days on a voyage from London to Rio, with a fire raging in the hold and the decks red-hot.

Notice has been given by the Post-office Department that the rate of postage applicable in Canada to letters addressed for delivery in Canada or the United States has been reduced to 3 cents for each ounce or fraction of an ounce.

The flour-mill syndicate talked about for some time past, to embrace the principal mills in Minneapolis, is pronounced impracticable.

A memorandum of the industrial conditions of England has been prepared for the London Board of Trade from the reports of numerous trade societies, and the inference is drawn, comparing one with another, that the tide of trade is nearing high-water mark. The proportions of men on out-of-work benefit are yet somewhat higher than in the best of times, but this may to some extent be accounted for not only by improved methods of production, but by the very large amount of extra time being worked by the men employed, which naturally tends to restrict the demand for workmen. Those societies which have reported show a total membership of 192,973, many of them having increased in strength considerably during the past year. Of this total 3798 are out of work, as against 4000 for the same societies last month, a decrease of 202 only, all of which is due to the building trades. Last month the proportion per cent. of unemployed was 2.17, now it is 2, so that the change is of the slightest. The iron and coal trades continue to be well employed, and are remarkably free from serious disputes.

The Cleveland Plaindealer says: "The railroad companies are reaching out for the iron business by lowering freight rates to meet competition among manufacturers, but as yet Cleveland has received little benefit from the reduction. The New York, Pennsylvania and Ohio Railroad have posted a tariff on manufactured-iron articles and pig-iron from points in the Mahoning and Shenango valleys, which will be a reduction of 20 per cent. on the present rates. The new rates will go into effect May 30, and will affect west-bound business. The rates will hold good until August 31, after which the tariff now in effect will be reinstated."

To abate the rabbit nuisance in New Zealand a ferret-breeding establishment is maintained on one of the estates which will let loose 800 ferrets; 400,000 skins a year were sent to market from the station, and although the rabbits are now pretty well under control, over \$3000 a year is still expended in their destruction.

As the elevated tracks of the Pennsylvania road in Jersey City push their way toward the depot many inquiries are made as to how the work can be completed while more than 200 passenger trains and dozens of freight trains are run daily over the same ground. There will be three rows of iron columns to support the girders along which the four elevated tracks are to run. One of these rows of columns will be between the present surface tracks and the other two rows on the outside. The inside row and one of the outside rows for probably the whole length will first be built, and the superstructure will be completed with two tracks above. This

will permit the use of these two elevated tracks and the one directly beneath them, so that the third row of columns and the superstructure of the second half can be erected without interruption from travel over the second surface track.

It is stated by a prominent brewer that 11 of the 72 breweries in New York and vicinity have fallen into the hands of an English syndicate, who have a capital of \$7,000,000 and will issue bonds in London. In one instance a brewery that was paying 5 per cent. on an invested capital of \$500,000 was bought for \$600,000, and the syndicate propose to bond it for \$800,000 and guarantee 15 per cent. on this amount. A number of American brewers have consolidated their interests in opposition.

A serious explosion took place last week at the New Jersey Extraction Works, Elizabethport, in which one man was fatally and three others severely injured. The disaster was caused by the bursting of a new furnace filled with molten copper. Owing to its being a holiday only a few men were employed around the furnace. Usually there are 20 men kept working about the furnace drawing off the melted copper. The furnace was blown to pieces and the fragments were scattered in every direction. The furnace was constructed at the foundry of Samuel L. Moore's Sons and was recently built. The damage to the company by the explosion is estimated at \$6000.

King Kalakaua, of the Sandwich Islands, will visit the Paris Exposition if he can borrow the \$10,000 for necessary expenses.

Ex-Minister McLane, in his farewell letter to President Carnot, of France, referred to the immense region of the great West—a region which is tending to become more and more the center of population and industrial, commercial and intellectual activity of the United States; a region which French explorers helped to open to civilization, and that not many years ago.

Mr. Ryan, the new Minister to Mexico, was honored with a banquet on his arrival at the capital.

New Decatur, Ala., was the scene of a grand industrial celebration last week, which continued two days. Visitors were taken in steamboats to the Government works at Mussel Shoals, on which nearly \$5,000,000 have been expended, with the object of opening navigation from Knoxville, Tenn., by way of Chattanooga and Decatur to the Ohio and Mississippi rivers, thus benefiting the immense iron, coal, timber and agricultural interests of 56,000 square miles of territory, embracing the Tennessee Valley and its tributaries.

Charles Preston, secretary of the Haytian Legation, claims to have received cablegrams that Legitime still holds Port au Prince, but the weight of evidence goes to show that Hyppolite, of the Northern party, is the victor, and New York merchants are expecting more active trade, especially in coffee, of which it is said large quantities are awaiting shipment. It is stated in Washington that the demand of the United States respecting the maintenance of a coaling station in Hayti will be conceded without dispute. Hence no necessity for appointing a commission. Admiral Gherardi, just returned from Port au Prince, confirms the reported successes of Hyppolite, the rebel chief.

New South Wales has renewed the contract with the Oceanic Steamship Company for one year to carry the Australian mails which the Canadian line of steamships was seeking to obtain.

Secretary Noble has approved the plan of operations for continuing the irrigation



survey of arid lands proposed by Major J. W. Powell, director of the Geological Survey.

A large force of expert bridge-builders started from this city for Johnstown.

The building of the Jersey approach to the big bridge of the Baltimore and Ohio Railroad over the Kills is progressing rapidly. It will be completed by August 1. The approach begins at Roselle, and when finished will be six miles long.

The British Government has ordered a fleet of three vessels to Behring Sea pending the question of jurisdiction of the United States respecting the Alaska seal fisheries.

Fires in cotton cargoes from the United States are more frequent, despite the precautionary measures adopted by the boards of trade and other organizations. The narrow escape of the *Rugia* and a case of spontaneous combustion on the *Servia* at Liverpool are the latest examples. The difficulty is attributed to negligence in loading.

Chief Engineer Walter Katte, of the New York Central, says Italian railroad laborers haven't driven out Americans by working for less, because wages are higher than they were several years ago. The Italians get about \$1.20 to \$1.30 a day for ordinary work.

The graduating class at Cooper Union this year is larger than ever before. The number of students attending the different branches of the school is 3521, of which 3127 are men in the night school. The prizes from Wilson G. Hunt comprise one of \$15 in gold for mechanical drawing to Albert D. Mead.

The proposed enlargement of the State House in Boston will cost \$2,500,000.

Berlin cable dispatches announce that the Samoan treaty has been agreed to and the text forwarded to Washington for confirmation. It is claimed that the United States' view of the case has been very generally adopted, and our commissioners are more than satisfied with the result.

The Southern development of coal lands is having the effect to diminish materially the river trade below Pittsburgh, and it is intimated that the Southern market may be lost entirely.

Samuel D. Cock, owner of a large foundry in Callao, died in that port on March 24. All the leading papers of Lima and Callao paid feeling tributes on the occasion of the decease of this gentleman, who was one of the oldest members of the British community in Peru.

Salamanca, the new Captain-General of Cuba, has been enthusiastically received.

It is stated that the Omaha Railroad Company have completed an arrangement with the Oregon Railway and Navigation Company to connect the two lines, making a new transcontinental route.

The estimate for expenses of the New York Fire Department for next year is \$1,089,000, including \$270,250 for new buildings and equipments.

The statement that a dozen steel steamers for the lakes are to be built soon is discredited by the Pennsylvania Railroad Company, who were said to be one of the parties interested. A large addition to the lake fleets would not be warranted by the present state of business. A Buffalo paper says the same mammoth steel steamer line makes its appearance once a year and then drops as suddenly as if struck with a club.

The Legislature of Texas has passed a law making it a criminal offense for the freight agents of lines doing business in that State to meet for the purpose of mak-

ing rates. The law makes such an act conspiracy, and imposes a term in the penitentiary of ten years upon conviction. It also prescribes that rates may be lowered, but in no case may they be advanced. If competing roads should, in a rate war, reduce freight rates to a ruinous minimum, that minimum must be thereafter observed, and any attempt to advance rates by agreement will make the agents amenable to punishment under the conspiracy law.

Applications for 26 town sites in Oklahoma are on record.

The new iron rates on the Pittsburgh and Lake Erie Railroad go into effect June 17. They will apply on stuff from Wampum, Youngstown and other valley stations to the points in the vicinity of Scottdale. The new rates are as follows: On muck, scrap iron, billets, blooms and skelp iron 24,000 pounds minimum carloads, \$1.30 per gross ton; pig-iron, \$1.15; cinder and scale, \$1.10.

The tank system of making window glass, which has been so successful in Belgium, is being tried in Pittsburgh with good results. The tank used there by the T. Campbell Company is said to be the largest in the world, measuring 120 feet in length and 20 feet in width. It has a capacity of 760 tons of molten glass. Forty-eight men; blowers and gatherers, are at work at the same time and the weekly production of the tank is expected to be 6912 50-foot boxes of glass. The glass is declared to be without a blemish.

#### Fraudulent Bills of Lading.

The United States Supreme Court has just rendered a decision of much interest to the commercial world on fraudulent bills of lading.

Easton, the agent of the Texas and Pacific Railway Company at Sherman station, gave to Joseph Lahnstein a regularly drawn and signed bill of lading for 200 bales of cotton. Lahnstein indorsed the bill, drew a draft for \$8000 on Friedlander & Co., of New Orleans, and sent the two to that firm, who paid the draft.

It was subsequently learned that no cotton had been delivered to the road, that the bill of lading was fraudulent and that Easton and Lahnstein had acted in collusion. Friedlander & Co. sued the railroad company. They claimed that as the bill of lading was in regular form and issued by the company's agent, the company were liable.

The Supreme Court decides that the company were not liable. Here is what Chief Justice Fuller says:

"The company not only did not authorize Easton to sign fictitious bills of lading, but they did not assume authority themselves to issue such documents, except upon the delivery of the merchandise. Easton was not the company's agent in the transaction, for there was nothing upon which the agency could act. Railroad companies are not dealers in bills of exchange, nor in bills of lading; they are carriers only, and held to rigid responsibility as such.

"Easton, disregarding the object for which he was employed and not intending by his act to execute it, but wholly for a purpose of his own and of Lahnstein, became *particeps criminis* with the latter in the commission of the fraud upon Friedlander & Co., and it would be going too far to hold the company under such circumstances estopped from denying that they had clothed this agent with apparent authority to do an act so utterly outside the scope of his employment and of their own business. The defendant cannot be held on contract in the absence of goods, shipment and shipper; nor is the action maintainable on the ground of tort."

## MANUFACTURING.

### Iron and Steel.

Work on the new furnace of the Carrie Furnace Company, at Rankin, Pa., is being prosecuted vigorously, and it may possibly be ready for blast during the present month. It is being fitted up with Massicks & Crooke's hot-blast stoves, of which McClure & Schuler, of Pittsburgh, are the sole agents in this country. The furnace when completed will have a capacity of about 200 tons per day.

Warwick Furnace, at Pottstown, Pa., was successfully blown out on May 28, after a blast of 180 weeks, during which the furnace produced 107,600 tons.

A preliminary meeting of the manufacturers of steel shafts was held at the Hotel Anderson, Pittsburgh, last week, for the purpose of forming an association for mutual protection. Only three manufacturers were present, but matters pertaining to the trade were discussed. Another meeting will be held at an early date, when a large attendance is expected.

Charlotte Furnace, at Rochester, N. Y., made its largest output for one month in May, when an average product of 56 tons a day was attained of No. 1 and No. 2 foundry. The furnace is now making over 60 tons a day, mostly of No. 1.

Work on the new rod mill now in course of erection by the New Castle Steel Company, at New Castle, Pa., is progressing in a satisfactory manner, and it is expected to be ready for operation not later than September next. The plant will have a capacity of about 150 tons of rods per day, 100 tons of which will be used by the New Castle Wire Nail Company, of that place, while the balance will be sold in the open market. Employment will be given to about 100 men.

Walton Furnace, at Max Meadows, Va., the property of the Lobdell Car Wheel Company, of Wilmington, Del., has just been blown in.

Mt. Laurel Furnace, Clymer Iron Company, Temple, Pa., was banked on the 16th ult., in order to make necessary repairs.

For the week ending on Saturday, the 25th ult., Neshannock Furnace of the Crawford Iron and Steel Company, at New Castle, Pa., turned out 1411 gross tons of pig-iron. This is the largest production for the same length of time in the history of the furnace.

Gaylord Furnace, at Detroit, is out for general repairs.

We are informed that the report that the Moorehead-McCleane Company, of Pittsburgh, had notified their employees of a 10 per cent. reduction in wages is without foundation. The firm will wait until the Amalgamated Association presents its scale for the coming year before declaring their intentions.

Joanna Furnace, in Berks County, Pa., has started up after over two years' idleness. The furnace has undergone extensive repairs, enlarging its capacity, with new engines and boilers, making it one of the finest charcoal furnaces in the State.

After a successful run of nearly four years, No. 11 furnace of the Thomas Iron Company, at Saucon, Pa., will blow out the present week to make repairs.

Carnegie, Phipps & Company, Limited, of Pittsburgh, have extended the limit of time for the signing of the agreement at their Homestead Steel Works until the 10th inst. The original intention of the firm was to give their employees until 12 o'clock noon, June 1, to sign the new

sliding scale. If any of them did not do so by that time, their positions would be declared vacant.

The Glendon Iron Company, at Easton, Pa., are pushing forward repairs on stack No. 3. Their No. 2 stack, which has been in blast some time, is now out of service. This leaves but one furnace in blast.

The charcoal furnace of the Jefferson Furnace Company, at Oak Hill, Ohio, has been lighted.

Topton Furnace, of the Topton Furnace Company, at Topton, Pa., is undergoing extensive repairs at present, and will be ready for blast in a short time. At present the owners of the furnace are undecided whether to put it in blast when repairs are completed or allow it to remain idle until there is an improvement in the iron business.

The stack of the Vigo Iron Company, of Terre Haute, Ind., was blown out on May 22, and will probably be idle until fall. The stack will be raised 12 feet, and otherwise improved.

The Columbia Rolling Mill Company, of Jersey City, N. J., have bought a portion of their mill machinery, covering about 100 tons, to be delivered before June 15, and hope to have the balance, including boilers, engines, &c., in place before July 15.

The fact that the Valley Iron Works, of Coatesville, Pa., have resumed operations in full for the first time in three years, and that the Brandywine Iron Works and the Viaduct Mills, both of the same place, are now running in full force, would seem to indicate that the plate-iron industry of Eastern Pennsylvania is in a flourishing condition.

A contract for an important addition to their plate mills has just been given by Huston & Sons, of Coatesville, Pa. The new mill will be erected south of their present works, and will be made entirely of iron and fitted up with the most improved modern machinery. Several sets of rolls, 10 feet long and 36 inches in diameter, will be put in, and a large steam crane will be used for conveying the piles to and from the furnace. It is hoped to have the new plant in operation by January of next year.

Respecting the iron-works at Johnstown the Philadelphia Press of Wednesday says: "The news in reference to the situation of the Cambria Iron Company's affairs in Johnstown is much more favorable. It is said the company's furnace stacks were not even chilled, the gas and water-works are intact, and the Baltimore and Ohio tracks at Johnstown, which the company built, are not much damaged. The company have 1000 men at work clearing up the debris at one portion of the works, and will start up as soon as possible. The loss of the company has of course been very large, but it is not as heavy by any means as at first supposed."

#### Machinery.

The Atherton Machine Company, of Lowell, Mass., are employing an extra large force of men, and are turning out large orders for machinery to go to all parts of the United States.

Work has been commenced on new machines for the Clinton Wire Cloth Company, of Clinton, Mass., the increase in capacity being necessary to meet the demand for the "silver finish" brand of poultry netting made by this concern.

The various offices in the Westinghouse Building, at Pittsburgh, are kept cool by electricity. Nickolo Tesla, the inventor of the alternating current motor, has completed an adaptation of his motor to a fan, or to the revolving shaft of fans, for the production of cool air. The motors range

from  $\frac{1}{2}$  to  $\frac{1}{4}$  horse-power and are of the simplest construction, consisting only of a shaft revolving in an iron cylinder. There is no delicate machinery connected with the motor. After it has been attached to the electric current usually operating door-bells or lamps in private residences it will run forever, requiring only an occasional oiling of the bearings. The rapid rotation of the fan connected with the revolving shaft produces a current of cool air in the room.

The Laidlaw & Dunn Company, of Cincinnati, have received the contract for the entire pumping outfit to supply the United States barracks at Newport, Ky. This outfit is located at the new reservoirs of the Covington water-works. This concern is doing a large business in its standard Duplex pumps.

The Berlin Iron Bridge Company, of East Berlin, Conn., have closed a contract to build for the Franklin Moore Company, of Winsted, Conn., a new iron bridge, 40 x 100 feet, to be used as a forge shop. The building will be entirely of iron, without any wood-work about it, in order to insure absolute safety against fire. The same company are building for the Anaconda Smelting Works, of Anaconda, Montana, an iron building 325 feet wide by 600 feet long. This building is also entirely of iron, iron trusses covered with corrugated iron, and replaces the entire plant of the company which was lately destroyed by fire.

The Energy Mfg. Company, 1115 South Fifteenth street, Philadelphia, have within the last couple of months made shipments of their rope hoisting-machines, center-grinders, &c., to the following places: Australia, Alabama, Arkansas, California, Colorado, Connecticut, Dakota, Delaware, District of Columbia, Illinois, Indiana, Iowa, Maine, Massachusetts, Minnesota, Nebraska, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont and Virginia. This list of localities to which shipments have been made gives an excellent view of the very wide scope of the trade enjoyed by this company.

The Westinghouse Electric Light Company, of Pittsburgh, have just secured a large contract in Sterling, Ill., for the erection of a plant of 750 arc lights. The whole costs \$15,000.

The Putnam Machine Company, of Fitchburg, Mass., have just presented an illustrated catalogue, which gives in brief the history of the Putnam Company, followed by handsome engravings showing the many lines of tools manufactured by them. These include lathes of all kinds, gear-cutting machines, slabbing or milling machines, drills, die, bolt and nut-tapping machines, planers, car-wheel borers, slotting and paring machines, reamers, taps, dies, drills, &c. The catalogue not only presents a perspective view of the many machines made, but in some instances also presents such sectional drawings as may be necessary in order that the reader may fully understand the construction and operation of the machine. A complete description is also given of the well-known Putnam automatic cut-off steam-engine.

The Jeffrey Mfg. Company, of Columbus, Ohio, report a steady demand for their elevating and conveying machinery. They are running their works full time, and the prospects for business in their line are good.

From John Adt & Son, of New Haven, Conn., we have received one of their new catalogues illustrating and describing their machinery for wire-workers and hardware manufacturers. This includes their wire straightening and cutting and

wire straightening machinery of various kinds and sizes, which are so well known. They also describe their automatic shear-point staple machines, elastic rotary-blow riveting-machines, butt-milling and butt-drilling machines, adjustable drilling and countersinking machines, and foot presses and double-head drilling and milling lathes. Some of these machines we have presented in former issues of *The Iron Age*.

Among the recent purchasers of the patent friction covering now being manufactured by the National Pulley Covering Company, of Baltimore, are the following: Owosso Tool Company, Owosso, Mich.; H. P. Duschler Company, Hamilton, Ohio; Merrimac Mfg. Company, Scranton, Pa.; Norfolk Knitting Mills, Norfolk, Va.; Coonell Mfg. Company, Ann Arbor, Mich.; Wardnell Needle Works, Lake Village, N. H.; R. C. Dunn & Bro., Goldsboro, Pa.; Lindsey Bros., Middletown, N. Y.; W. S. Conger, Litchfield, Mich. Their business in one week recently came from 15 widely-separated States.

From Nicholson & Waterman, of Providence, R. I., the well-known makers of a full line of nut machinery, we have received a valuable treatise on stay bolts, which opens with a description of the duty to be performed by a stay-bolt, and then considers the methods now practiced of securing the bolts. The pamphlet treats the subject solely in a practical way, points out the difficulties encountered, and suggests the remedy.

#### Miscellaneous.

The Berlin Iron Bridge Company, of East Berlin, Conn., have just issued a large catalogue in which they illustrate their line of work by means of engravings made directly from photographs of actual structures built by them. The views presented have been so selected as to convey a very clear idea of the types of iron railroad and highway bridges built by them; also their method of building cylinder piers with piles and concrete. Following this is an extended description, copiously illustrated from work actually done, of their various forms of iron roofs for factories, depots and other buildings in which the span is considerable. These cover cases varying in magnitude from the grand iron train sheds of the New York, New Haven and Hartford Railroad at New Haven down to platform coverings for depots. They also present a list of many large and well-known firms for whom they have erected iron buildings during the past few years. Following this are the various forms of angles, T-bars, channels, beams and girders; also iron doors and shutters. In the back part of the book is a long list of iron and highway bridges built by the Berlin Company, and also a large collection of testimonials which commend the durability, simplicity and strength of their bridges.

In a recent issue of the *North American Review* Prof. R. H. Thurston, of Cornell University, and an authority on the subject of steam-engines, expresses it as his opinion that this invention is capable of vast improvement, and that it has not yet begun to exhaust its inherent powers. On the basis of greater developments in the application of inventions to the steam-engine Professor Thurston predicts that the next generation will see it consuming 1 pound of fuel per hour for a single horse power; that ships of 20,000 tons will be driven at the rate of 40 miles per hour; that the American continent can be spanned by flying trains in two days and that transportation between the cities of the Atlantic and those of the Pacific coasts will be so cheap that the general average of living will be vastly improved upon what exists to-day.



# The Iron Age

New York, Thursday, June 6, 1889.

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JOHN S. KING, - - - BUSINESS MANAGER.

## The Appalling Calamity at Johnstown.

The columns of the daily newspapers are filled with details of the terrible catastrophe which befell Johnstown, Pa., on the night of last Friday. What was then one of the most flourishing of the inland cities of Pennsylvania, with 80,000 people in its natural boundaries, is now a storm-swept waste, with a few ruined buildings and but a part of its former population of busy workers. Its industries have been almost annihilated, its people have been reduced from comfortable circumstances to abject want, and its future has been suddenly transformed from one of brightest possibilities to one of doubt and darkness. The records of a century show nothing on this continent at all approaching the Johnstown horror in loss of life. Its suddenness was also a peculiar element, adding terror to the occasion. One rush of the fatal flood, a short season of swirling waters and crashing buildings, and the destroyer had done his work. The various forms of pestilence which have at times devastated portions of the country have given their victims warning of their approach, and even such earthquakes as have visited us have been merciful in their death-dealing power as compared with this latest frightful example of the destructiveness of the forces of nature. The annihilation of at least one-fifth of the total population of the valley in a time which could be measured by minutes is an awful occurrence, passing our powers of comprehension.

It appears from the best accounts of the catastrophe at hand that there were three stages in the disaster. First came a flood in the two streams which unite at Johnstown, caused by a heavy rain of some two days' duration; the second was the breaking of a lumber boom on Stony Creek, which sent a large number of logs crashing through that part of the town overflowed by its waters, and the third, and the most calamitous of all, was the giving way of the dam at Conemaugh Lake, located ten miles above Johnstown on a branch of the Conemaugh River. When the lumber boom on Stony Creek was broken the enormous mass of logs, hurled down the stream and over the submerged district of the doomed city, tore away the houses as though they had been built of cards. While this work of destruction was still going on there came down the valley of the Conemaugh a towering mass of rushing water from the burst embankment at Conemaugh Lake, which swept with resistless force over the remaining houses and buried them under fathoms of water or carried them at once down the stream. Below the city is a stout stone bridge over the Conemaugh River, built quite recently by the Pennsylvania Railroad

Company. Against this the mass of *débris* became lodged; the waters were backed up and overflowed all the space where the streets of Johnstown had been. And then, as though horror was fated to be piled on horror, fire broke out in the *débris* and burned to death numbers of human beings who had been carried thither in their frame dwellings.

The great rain storm which was the immediate cause of this dreadful occurrence prevailed over a wide section of the country from New York to Virginia, washing out railroad bridges, sweeping away trestles, causing land-slides, breaking down telegraph wires and interrupting railroad travel and means of communication by wire for several days. Information from Johnstown which was at first received by the outside world was, therefore, meager, and the frightful calamity briefly narrated in the press dispatches was thought to be exaggerated. But, unlike almost every other disaster, the proportions of this one have grown larger with every hour bringing more complete details. Nothing has transpired to mitigate its unvarying tale of loss of life and the terrible experiences of the survivors except that occasionally some one at first reported dead proves to have been rescued.

Conemaugh Lake, which is above alluded to as having burst its bounds, was an artificial sheet of water held in place by a dam. It was about  $8\frac{1}{4}$  miles long, 1 mile wide, and in some places 100 feet deep, and is said to have been the largest artificial reservoir in the United States. It was not constructed for useful purposes, but for pleasure, and is the property of a corporation called the South Fork Fishing and Hunting Club, composed principally of residents of Pittsburgh. Its outlet was from 200 to 300 feet above the level of Johnstown. The citizens of that place were aware of the danger to which they were exposed by the possible bursting of the dam, but rested quietly within the shadow of trouble from that source, confiding in the examinations known to be made from time to time by capable engineers, who regularly reported it staunch and able to withstand any force short of a convulsion of nature. It is presumed that the dam was weakened by the excessive rainfall and strained by the unwonted accumulation of water in the lake, and that a sudden cloud-burst supplied the conditions favorable to its collapse, which was attended with such sorrowful results. Criticism, denunciation and fiery words of reproach are being freely used against the unwitting authors of the destruction of Johnstown, and it is possible that the responsibility of the members of the club may be tested by suits at law. But no reparation is now possible, from this or any other source, that will mitigate the sorrows of those who mourn their loved ones.

The measures of relief for the sufferers by the floods are on a scale corresponding with the extent of the disaster. New York City immediately responds with large sums. The New York Chamber of Commerce on Tuesday held a special meeting. Like movements were initiated by all the exchanges and other commercial bodies. The Connecticut Legislature appropriated \$25,000 for the flood sufferers, and the Massachusetts Legislature \$10,000. The Bethlehem (Pa.) Iron Com-

pany have directed the Johnstown authorities to draw upon the company for \$5000. Immense quantities of relief stores are being sent to Johnstown from Pittsburgh, Philadelphia and other points, transportation free. Latest advices from the scene of the disaster do not mitigate its horrors or its extent.

## Mercantile Opportunities in Japan.

Japan is now recognized as the leading nation of the Orient, although only 25 years have elapsed since she entered the field of modern progress. When the Tycoon was dethroned and the Tokugawa dynasty became extinct after a continuous reign of 800 years, there was scarcely a foreigner in the country outside of the treaty ports—the legation buildings at Yeddo being closed on account of the enforced withdrawal of the resident ministers. Christianity was prohibited by an edict posted everywhere on the public thoroughfares, and the entire population remained in a condition of Eden-like simplicity as regards raiment, and other domestic requirements such as call for the products of industry and ultimately create a market for articles of foreign manufacture. Today we find Japan the very foremost of Asiatic nations, whose commerce is expanding by "leaps and bounds," so that, as we are told on good authority, "instead of being only one-seventh of China's commerce, as it was ten years ago, it is already one-half, and will in all probability be equal to or greater than that commerce a few years hence." In all that constitutes national greatness—in her system of government, her naval and mercantile marine, railroads, telegraphs, water-works, shops and manufactories—Japan is advancing with amazing strides.

At the present juncture the question is pertinent whether the United States Government, or rather the mercantile representatives of that Government, are hastening with due alacrity to take advantage of the special privileges and prerogatives acquired under the treaty with Japan in February last. It will be remembered that at that time, after protracted but unavailing endeavors on the part of the great powers acting in unison to effect a treaty revision, Japan approached each of them separately. The negotiations of 1886-87 were effective only in convincing Japanese diplomats that to reconcile the conflicting interests and prejudices of seventeen powers was impossible, except at the price of abject humiliation. Thereupon it was determined, by a masterly stroke of policy, to remove the "stigma of international isolation," and almost simultaneously with the promulgation of a constitution on February 11, attended with an exuberance of national feeling rarely manifested on any occasion, Japan's overtures to the United States were promptly accepted, and as a consequence Americans will soon, before the end of 1889, be in the full enjoyment of freedom to trade, travel, reside or own property anywhere within the limits of the Empire, but on the condition of fully recognizing Japanese jurisdiction, as in any other independent nationality.

Meanwhile it is interesting to observe the attitude of the European Powers, to whom proposals similar in terms were like-

wise submitted. The London *Times*, admonished by its correspondent at Tokio, who presents the subject in much fullness, is inclined to reproach the imperial authorities for their indifference, lest through their inaction the position now occupied by England in Japan and the share she now enjoys in her foreign commerce be taken "by some other power, such as the United States, which is more sensible of the commercial substance. Either we must accept the terms offered to and accepted by the United States," says the editor, "or we must yield the command of the Japanese markets to our principal commercial rivals in Japan." The question again arises: Are merchants in the United States availing themselves of their opportunities? A communication from the Minister of Foreign Affairs or Department of State setting forth the present position of affairs and the advantages incidental to the situation would be well received.

#### American Ocean Steam Traffic.

The annual report of the Pacific Mail Steamship Company states that the new 5000-ton steel steamship contracted for in Glasgow will be built at a "saving of one-third in cost over the prices quoted by the ship-builders on this side of the Atlantic." She is, however, debarred from carrying the American flag, and likewise excluded from the American coastwise trade. Neither is she eligible for mail pay from the United States beyond sea postage. "But the policy so far displayed by our Government," says the report, "has not warranted the managers in supplying their needs in the United States at such a material difference in cost." The action of the Pacific Mail Company in placing this contract in Europe was not graciously received by builders in the United States. Nor is it likely that these builders will concede that they are handicapped to the extent of one-third, if due allowance is made for the superior materials and workmanship required under the American standard. The report intimates that under a more liberal policy—doubtless meaning more liberally in the matter of mail contracts, or a bounty system of some kind—it will be "an easy matter for the company to qualify therefor by providing additional American tonnage."

Incidental to this subject a report comes from Washington that President Harrison and members of the Cabinet will soon have a prolonged conference with the officers of the Brazil Mail Steamship Company, with reference to the alleged discrimination against the American ocean marine, under the present maritime laws of this country. H. K. Thurber, the president of the company, is understood to have prepared documents, at the request of the authorities in Washington, showing the hardships now experienced by American companies in the unequal struggle with the subsidized lines of Europe. In the case of the Pacific Mail Line the company, aside from ordinary disabilities, have suffered from the operations of the Chinese restriction act and from the suspension of work on the Panama Canal, as well as from the competition of the subsidized steamships of the Canadian Pacific Company plying between Vancouver and Asiatic ports.

American ship-builders are said to be much elated at the prospect of a conference with the new Administration, hoping that it will be the inauguration of a policy looking especially to the relief of the interests of the ocean carrying trade, and in behalf of which all measures thus far attempted, either by the National or State governments, seem to have been wholly ineffectual and nugatory.

#### The Buffalo Railroad Complaint.

The New York State Board of Railroad Commissioners have rendered a decision in the complaint of the city of Buffalo. This complaint was founded on the fact that local rates between Buffalo and New York were a little more than the proportion of the through rates between the same points. In these days of severe competition a little difference like this in question prevents Buffalo from buying at the West to sell again at the East, or *vice versa*. It was claimed that the city was entitled to such a local rate as would permit this, and without ordering it so, the State Commissioners think that the claim is just. The decision does not go beyond suggestions, because the matter runs into interstate complications, and the Interstate Commission, in the somewhat similar complaint made by Detroit, took ground exactly opposite. Detroit, it will be remembered, asked for such a system of tariffs to and from the sea-board as would enable it to secure a share of the grain and jobbing trades of the States further away. But it was held that no city "owned" any trade whatever, and none was entitled by natural right to any lower tariffs founded merely on the desire to control trade, especially if such a plan would result in actually higher prices to the consumer.

In the Buffalo case the New York board anticipate the possible effect of granting *pro rata* rates to that city, and bluntly say that it would be right even if it resulted in higher through rates between the far West and the sea-board. Such a thing, however, is out of the question. The canal and the lakes, to say nothing of many other commercial conditions, must always force minimum through rates upon the rail carriers. It is beyond the power of the railroad managers to put what rates they may wish upon breadstuffs or manufactures, and the New York board must know it. Another and strong objection to any such increase of rates is the increased cost to the consumer or to the manufacturer; and when we consider that this proposed increase is to be put upon traffic in order that the middle-men of a particular city may do a larger business, it seems a wrong to the public even to advocate it. If once the principle be granted, it is only a question of time when all intermediate cities will demand the same jobbing privileges, and it would be very difficult to say why one should have it and not another. The end of such a state of things would be the practical breaking up of long routes of transportation at cheap rates, for every through rate would necessarily be no lower than the sum of a number of high locals. Any other system like the present must injure the middle-men's trade at some point or points between.

Buffalo has manifest advantages as a jobbing center. A large lake traffic out

and in makes it a natural distributing point, and its enterprising citizens have not been slow to use their opportunities. Coal, ore, breadstuffs and many products and manufactures are there transferred from water to rail or water. The city does not need other advantages for its prosperity. In concluding their decision the board say, speaking of *pro rata* rates for Buffalo: "Otherwise the result will be that the centers of business and distribution will be pushed further and further West, to the detriment and eventual paralysis of Eastern cities—a result which certainly will not be calmly tolerated." This opens up a wide subject. Do the commissioners mean that Buffalo is entitled to such a system of freights as to give it power to stop sea-board traffic and distribution in the trans-Missouri States? Undoubtedly a city should have reasonable tariffs, but where to draw the line in our complicated mercantile system is a problem yet unsolved.

#### China's Trade in Metals, Petroleum, &c.

Mr. E. McKean, the secretary for statistics of the Chinese maritime custom-houses, has just published his returns for 1888, as compared with those of former calendar years. They are more complete, and consequently more valuable, than they have been heretofore, particularly with reference to metals, about which the world at large has hitherto been but ill-informed, especially as regards tin and lead, now given in detail. The figures are given in Haikuan taels of \$1.24 American.

The import into China through the treaty ports was as follows:

Taela.		Taela.	
1883.....	73,567,708	1886.....	87,479,328
1884.....	72,790,758	1887.....	94,324,518
1885.....	88,300,018	1888.....	106,561,372
Total.....234,528,478		Total.....287,765,518	
Increase.....53,237,039, or 23 per cent.			
Iron.		Tin.	
Piculs.		Piculs.	
1883.....	817,526	71,062	190,723
1884.....	843,532	51,447	108,104
1885.....	1,202,880	66,700	159,783
Totals.....2,863,938		189,179	
1886.....	1,063,371	50,323	215,997
1887.....	1,023,080	40,556	222,228
1888.....	1,298,408	77,225	220,797
Totals.....3,404,839		168,804	
Increase.....540,351, or 15%		Dec. 20,575, or 11%	
		Inc. 205,950, or 45%	

Reduced to tons of 2240 pounds (1 picul equaling 134 pounds) the import in 1888 was:

Tons.		Value.	
Taela.		Taela.	
Iron.....	77,000	2,185,288	
Tin.....	4,800	2,135,721	
Lead.....	13,670	1,006,271	
Total.....		5,327,278	
Other metals.....		1,560,845	
Total.....		6,887,123	

On the other hand, 15,000 piculs of tin were shipped through the ports of Pakhoi and Ichang in 1888, probably at the time when the French syndicate had raised prices to a point inducing re-exportation. The import of petroleum was as follows:

Gallons.		Stock at	
Gallons.		Shanghai	
		December 31.	
1885.....	14,000,000	1,250,000	
1886.....	23,038,101	10,508,000	
1887.....	12,015,135	5,500,000	
1888.....	16,613,060	5,000,000	

Since Russian refined has begun to compete with our petroleum in China there is a tendency to overstock the Chinese market, and henceforward this branch of the trade will be subject to extreme fluctuations in the supply and price.

The mills of British India are fast supplanting Manchester in the twist trade with China. Thus Shanghai in 1888 received 163,946 piculs of twist from British India and only 62,721 piculs from England. The general twist import into China developed as follows:

1878.	1880.	1882.	1884.	1886.	1888.
Piculs.	Piculs.	Piculs.	Piculs.	Piculs.	Piculs.
108,360	150,518	184,940	261,457	382,984	561,903

The amount of cotton piece goods imported into China in 1888 was 44,437,525 tael; in this trade the United States at times largely participates whenever the market out there chances not to be overstocked. Other imports in 1888 were: Fish, 2,637,132 taels; matches, 1,089,842; rice, 9,638,829. Match factories have been started on a large scale in China, the consumption of the article being enormous. The rice imported was 7,132,211 piculs; the famine, of course, stimulated the movement.

In 1888 China exported through the ports 92,401,067 taels' worth of products, against 85,860,208 taels in 1887. Her export of tea was as follows:

	1884.	1885.	1886.
	Piculs.	Piculs.	Piculs.
Black.....	1,564,451	1,618,408	1,654,058
Green.....	202,556	214,688	192,330
Brick.....	244,996	280,111	861,482
Totals.....	2,012,003	2,113,207	2,308,480
Taels.....	20,030,041	32,207,042	38,464,155

	1887.	1888.
	Piculs.	Piculs.
Black.....	1,629,880	1,542,209
Green.....	184,681	209,377
Brick.....	331,231	412,641
Totals.....	2,145,862	2,164,227
Taels.....	20,011,720	30,280,611

Russia receives the large amount of tea it imports from China overland via Kiachta. In the English market tea from British India rapidly supersedes Chinese, while of the tea consumed in the United States 50 per cent. is imported from China and the remainder from Japan.

China's silk export in 1885 was 20,001,175 taels; in 1886, 28,863,218; in 1887, 31,690,214; in 1888, 32,180,298. The export of Chinese straw mats declined from 150,942 piculs in 1887 to 79,938 in 1888. China exported in 1888 no less than 12,000 tons of paper, worth 1,650,298 taels. While China exported 60,000 tons of sugar, the import did not exceed 8680 tons; about 33 per cent. of the export went from Formosa to Japan.

American trade with China was as follows:

Calendar year.	Import into the United States.	Domestic export to China.
1888.....	\$17,557,841	\$3,196,055
1887.....	17,875,479	5,315,115

While our import from China is as a general thing steady, the domestic export, which is largely cotton goods and petroleum, naturally fluctuates widely where competition is so great.

A letter from Chattanooga extolling the advantages of that city as an industrial center says: "In less than a quarter of a century there has arisen, almost phoenix-like, a beautiful city, in the enjoyment of commercial power. Thirteen railroads radiate to all parts of the country; over 200 manufacturing establishments bring money into her coffers; a well-ordered street railway system, dummy lines and electric cars give local transportation facilities, while gas and electric lights, water-works, grand churches, good hotels, and everything that goes to make up a magnificent city are among the actual advantages which she enjoys. You could

find nowhere better appointed nor handsomer homes. There are besides a steel-rail mill, blast furnaces, wrought-iron pipe works, planing mills, iron and mantel concerns, an edge-tool factory, machine works, tack, nail and spike mills, a great forge, capacious brass and copper foundry, extensive tanneries, various wood-working establishments, a brick-yard turning out fine pressed brick, a stained and plain glass works, car and wheel shops, agricultural works, barbed-wire mills, carriage and wagon factories, and many more. All these are doing a good business."

### Great Destruction of Bridges.

The destruction of bridges, lumber, dams and other property by floods within the last few days, notably in Pennsylvania and New York States, but extending south through Maryland and Virginia, will make a lamentable aggregate. The Pennsylvania Railroad alone have lost more than 20 bridges, many of them large and costly. A Harrisburg railroad official estimates the loss of the company at \$3,000,000. On the Pittsburgh division the bridges between Altoona and Johnstown are gone, also the Mineral Point bridge and the Conemaugh bridge, the bridges at Linden and Montgomery on the Erie division, and three spans of the bridge at Williamsport. The Philadelphia and Reading lose the bridges at Milton and Sunbury. On the West Pennsylvania division the bridges at Blairsville, East Tunnel and East Leechburg are gone. The destruction of property at Hanover, Pa., is enormous. The railroad bridge at Mengis Mills was swept away. The Long Bridge at Washington is badly wrecked. To repair the damage the Pennsylvania Railroad purchased 4,000,000 feet of heavy timber at the large lumber yards along the line, Wilmington and Baltimore lumber yards furnishing about 1,000,000 feet more. The Pennsylvania Canal at and above Columbia is greatly damaged and all the rolling-mills are submerged. In Virginia the floods were disastrous. The trestle bridge of the Norfolk and Western Railroad and that of the Richmond and Petersburg Railroad Company across the Appomattox River at Petersburg were washed away; also Campbell's Bridge, and a new and costly iron bridge on the Petersburg and Weldon Railroad. The Chesapeake and Ohio Canal is damaged to the extent of perhaps \$1,000,000 and virtually destroyed. Losses in the Cumberland Valley are estimated at \$200,000. Eight bridges between Senaheim, Pa., and Gunpowder Falls, Md., along the Western Maryland Railroad, have been carried away. In New York State the losses are heavy. The losses at Elmira are put down at \$500,000. The Erie Railroad shops at Hornellsville were flooded and abandoned. The New York, Lake Erie and Western's new iron bridge across the Genesee at Belmont was swept away. The monster iron tanks of the National Transit Company on the flats at Olean suffered severely. The destruction of the Delaware, Lackawanna and Western bridge at Waverly will suspend all through Western traffic for several days. The losses of lumber at Williamsport and Lockhaven, Pa., on the Kanawha River and at other points are estimated at millions of dollars.

The contractors for the new cruiser Baltimore have notified the Navy Department that the preliminary trial of the ship will take place on June 15 in the Delaware River. In the official trial the ship is to show a speed of 19 knots upon an estimated horse-power of 10,500. The total cost of the hull and machinery, exclusive of her armament, was \$1,325,000, and most of this money has been paid over to the contractors.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 4, 1889.

The Bureau of Ordnance officers are very well satisfied with the outlook for the fabrication of modern high-power and long-range guns. The Bethlehem Iron Company, under their contract with the Government, from their new plant are now prepared to furnish the largest forgings which will be required for the heaviest ordnance under present designs. The Government has already completed a number of 6-inch and is finishing the 10-inch guns. It is now proposed to order a supply of 12-inch caliber, after which the 16-inch guns, the largest designed by the Naval Ordnance Bureau, will be given a practical test in the way of manufacture. The Bethlehem Company are now turning out the largest steel forgings ever attempted in the United States.

The guns for the Charleston's batteries are on their way to San Francisco. It was stated at the Navy Department to-day that the facilities were now such that guns of the different calibers can be turned out as rapidly as they will be required by the vessels now under construction. Engineer-in-Chief Melville and his chief assistant, M. P. Towne, U. S. Navy, with the competent force under their direction in the Bureau of Steam Engineering of the Navy Department, have completed the designs for the engines of all the vessels under way and which exceed in power anything ever attempted in the United States. The engines for the 3000-ton cruisers are designed to develop 10,000 horse-power and to make a speed of 20 knots an hour. These engines have six boilers; one pair, 14 feet 4 inches, another pair, 13 feet 4 inches, in diameter, and all 20 feet 4 inches long, and two donkey boilers, 10 x 18½ feet. There are four cylinders, one for high, two for low pressure, and one intermediate, with piston-valves. There are brass condensers, each with centrifugal circulating pumps for condensing and also air pumps. Each system of boilers is supplied with separate feed pumps and other appliances, and can be worked separately. They will carry 160 pounds of steam. The officers have great confidence in these engines, which are now under construction. All the boilers and all practicable parts of the machinery are made of steel, the shafts being hollow. Each engine has auxiliary condensers, and can work separately and also operate the twin screws. The engines for the 2000-ton vessels are triple expansion, with 5400 horse-power. There are four boilers 18½ feet and a donkey boiler 9½ feet long, all of them being 12 feet in diameter.

There is unusual activity in all branches of the Navy Department preparing designs of the hulls, machinery and ordnance for the new vessels authorized by Congress. Chief Constructor Wilson, with a large corps of assistants, Engineer-in-Chief Melville, assisted by Chief Engineer Towne and Commodore Sicard, Chief of the Bureau of Ordnance, with experts in their respective branches, are pushing work with the utmost rapidity.

If Congress exhibits the liberality indicated by the Republican Senate a few years ago, the close of the present Administration will find the navy of the United States one of the fleetest and finest in the world.

The Philadelphia Record says engine No. 206 on the Bound Brook Railroad, built on the Wootton pattern, ran eight miles at the rate of 39 seconds per mile, or over 90 miles an hour.

### A Model Electrical Manufactory.

An article in the *Stevens Indicator* for April, by L. W. Serrell, Jr., thus describes the new factory of the C. & C. Electric Motor Company, at 841 Greenwich street, New York City, employing over 100 men and depending upon electric power alone as a prime mover:

The building is a thoroughly fire-proof structure, built entirely of iron and stone. The floors are made of granolithic cement, with a slight slope draining to the center of the side walls to sewer connections, and may be washed down with a hose, or flooded in case of fire, with water taken from a 15,000-gallon tank on the roof. This tank also supplies the water necessary to operate the elevator, and receives its supply from an artesian well under the building. The walls are provided with conduits built in them for the electric wires. The electric-power generating plant is in the basement, and the only possible means of distributing power around the building is through the wires which run out of the dynamo-room. As the structure of the building does not allow of the running of belts from floor to floor, dependence is had entirely upon electricity as a motive power. The power-generating plant consists of a 12 x 12 inch Ball engine, belted direct to a No. 20 Edison dynamo, of 50,000 watts capacity, compound wound for 220 volts; the engine also drives through a counter-shaft a constant-potential and constant-current dynamo used in testing. A central station switch-board is arranged beyond the dynamo, from the "bus" wires on which are tapped independent circuits to each floor. At present four motors are employed, two of  $8\frac{1}{2}$  horse-power, one of 2 horse-power and one of 1 horse-power; yet these small machines, fixed in out-of-the-way places, furnish power for 22 engine lathes, eight drill presses of various sizes, four milling-machines, two power presses, several iron planers, besides tapping-machines, grindstones, emery-wheels and a 60-inch boring-mill, making in all a total of about 45 machine tools.

Power tests made in the engine-room, when a full force of men is working in the shops, show a load of 22 horse-power on the engine and an electrical output of  $13\frac{1}{4}$  horse-power on the dynamo. This may seem incredible, but when we remember that every time a machine is shut down the motor is instantly relieved of that amount of work and takes just so much less current, and the dynamo supplying less current takes less power to drive it, we can more readily see how such figures are not so improbable, after all, especially in cases where the shafting load is light. In actual practice probably not over half the machines are doing actual work at the same time; thus one man may be setting his work in position while the man at the tool next to him may have his machine in operation doing work. Hence in a carefully-laid-out shop, with short lengths of shafting making a light friction load, there may be installed machines requiring, if all were worked at precisely the same instant, nearly double the amount of power represented by the motors installed. This is analogous to the case of an electric-light station where the number of lamps placed on a circuit would require, if all were burning at precisely the same instant, more than double the amount of current that the generator feeding the circuit is capable of supplying.

A decided advantage is gained in this system of factory construction over the usual method of transmitting all the power by belting and long lines of shafting by being able to run any small portion of the factory independent of all the rest. For instance, if the work is behind in one department and it is necessary to work over-

time, that particular department of the shop, having a motor of its own, can be run without running any of the machinery or shafting in any other part of the building; and thus a great saving of fuel can be effected over the old method, where it would be necessary to run all the shafting throughout the entire building.

The building is wired for 220 lights, connected two in series, and each floor is provided with a separate switch-board, to which the terminals of the various light-circuits are brought. The circuits are so arranged that the darker portions of the shop may be lighted independently of the other portions. The building is heated with the exhaust steam from the engine, which exhausts into a 6-inch pipe that runs through the upper part of a large horizontal drum used as a feed-water heater, and thence up to the roof, where it exhausts into the air when not used for heating. The upper end of the exhaust-pipe is provided with a check-valve which opens when the back-pressure reaches a certain amount. Valves are provided in this main pipe at each floor, through which the steam may be turned into the heating-pipes. The latter are arranged in a manner similar to the "multiple arc" system of electric lighting. A 4-inch pipe extends along each side of the building and connects through the valve to the main exhaust; elbows are provided every 7 feet apart, from which run 8-inch pipes across the building, connecting the two 4-inch pipes together. The steam that condenses in these pipes returns to the feed-water heater through a smaller pipe, which connects to a spiral tube submerged in the water in the drums. With this arrangement the back pressure on the engine never exceeds 4 pounds. If for any reason the back pressure should exceed this amount the valve on the roof opens and relieves it. The C. & C. electric motors are built with interchangeable parts throughout, all parts being finished to standard gauges and drilled in standard jigs, while pedestals and caps are milled with standard cutters, thus insuring an interchangeability of parts that could be realized in no other way. From the practical standpoint the success of the plant has been unqualified. From the time steam was first turned on the engine until the present not a single stop for repairs has been necessary, and frequently the shops are run 15 or 16 hours a day.

A staff correspondent of the *Philadelphia Press* telegraphs as follows from Johnstown: "Powell Stackhouse, vice-president of the Cambria Iron Company, was here inspecting the ruined shops of the corporation. He said that the works would be rebuilt at once. The total loss to the company will be, it is thought, not more than \$5,000,000. It was established beyond doubt to-day that two prominent Philadelphians, connected with the Cambria Iron Company, lost their lives. One is Charles Butler, assistant treasurer, whose body was found; the other is Harry Clay Adams, University of Pennsylvania, and a member of the class of 1887, who was elected engineer to assist Mr. Joseph Morgan, the chief engineer. The first attempt was made on Monday to enter the Cambria Iron Works. A gang of 800 men was put to work, and they are removing the debris around the mill. At almost every step dead bodies are being unearthed."

A report is current that the Hudson River tunnel, which was originally intended to be an avenue for railroad freight trains, is to be used to carry water to this city for the syndicate who anticipate grabbing up the Passaic water-shed and making contracts with this city and Brooklyn.

### PERSONAL.

Arthur Holland, who has been connected for many years with Naylor & Co., of New York, Philadelphia and Pittsburgh, and who has of late held their power of attorney, was admitted as a member of the firm on the 1st inst.

William Hainsworth, for some years superintendent of the Pittsburgh Steel Casting Company and president of the Hainsworth Steel Company, also of Pittsburgh, has recently resigned both of these positions and sold his interests in the two firms. Mr. Hainsworth, it will be remembered, was the builder of the cast Bessemer-steel gun for the Government, but which failed to stand the test of the Government officials. Mr. Hainsworth's plans for the future are as yet undecided.

The Massachusetts Institute of Technology, of Boston, Francis A. Walker president, last week sent out about 70 graduates, among whom in mechanical engineering were the following: G. M. Basford, A. B. Bellows, W. G. Bixby, Z. W. Bliss, C. N. Borden, L. W. Bridges, H. H. Craigin, C. H. Cromwell, A. L. Davis, N. Durfee, E. V. French, F. W. Hobbs, E. S. Hutchins, L. E. Johnson, L. H. Kunhardt, W. W. Lewis, H. Loring, Jr.; F. E. Sanborn, W. G. Snow, R. Sweetland, W. W. Underhill, A. L. Williston, V. Windett and W. G. Winchett. Willard Goldthwaite Bixby read an abstract of his thesis work on the experimental determination of the strength of cast-iron gears. He was followed by Frederick William Bradley, of the department of electrical engineering, who described an experimental study of a Weston dynamo machine. Nathan Durfee, of the mechanical engineering department, read an abstract on a Wright compound engine at the Troy cotton and woolen manufactory at Fall River, Mass., and James Porter Gilbert, of the chemical course, told of the action of nitric acid on the bromanols. William Elton Mott, civil engineer, read an abstract which related to experiments on rubber models of riveted joints.

The President has appointed Charles L. Knapp, of New York, to be Consul-General of the United States at Montreal.

William H. Wallace, of New York, the well-known iron and steel merchant, sailed for Europe yesterday on the *Gallia* for the purpose of making an extended visit abroad. He was accompanied by his wife, two daughters and his son, Hon. William C. Wallace, member of Congress from New York City.

Capt. C. B. Sears, of the Engineer Corps, has been detailed by Secretary Proctor to report to Governor Beaver for engineering duty at Johnstown. He will superintend the construction of the pontoon bridges across the Conemaugh.

Public Works Commissioner Thos. F. Gilroy dismissed 80 supernumeraries in his department, a saving to the city of \$53,596 per annum.

John Frost died 8d inst. in Brooklyn, aged 70. His father erected the first iron-works in Brooklyn at Water and Jay street. For 11 years Mr. Frost was foreman of the Novelty Iron Works in New York, and for the last 30 years he had been foreman in Campbell & Thayer's Linseed-Oil Works.

W. H. Anderson & Son, Detroit, Mich., have removed from 38 Clinton street to more commodious quarters at 14 and 16 Macomb street, where they will continue the manufacture of stone, marble and granite workers' tools and supplies.



# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street,  
CHICAGO, June 3, 1889.

**Pig-Iron.**—Orders aggregating thousands of tons were placed during the past week, yet, in all probability, the number of buyers was not larger than in any one of the weeks of the two months previous. Local manufacturers of Agricultural Implements have been feeling the market for some time by insinuating that they would be inclined to buy their next season's supply if it could be had at satisfactory prices. Their offers were always about \$1 per ton below the market price. Dealers were not seeking orders covering ten months' delivery at so great a concession. Lately they have been talking higher prices in a tone of belief, and it is likely that buyer and seller came to terms by meeting each other half way. The placing of orders by these large consumers usually establishes the bottom figures on local Irons and calls into the market others who have been waiting their action. Notwithstanding the fact that it is at least 30 days in advance of customary time when the makers of Farming Implements buy it would not be surprising if the majority of them placed their orders this month. Many makers of Charcoal Iron have notified their agents that they would rather go out of blast than sell at less than what they were now getting, and some are not disposed to accept contracts covering a year's supply. Makers of Local Coke Irons are also firm in their views, but situated so favorably that they can afford to contest any price that may be named to customers of this market. Outside furnaces are making a strong fight to hold their trade and the railroads over which they ship are inclined to assist them by making a reduction in freight rates. Whether rates can be made low enough to be of any benefit remains to be seen. Through this conflict lower figures may result on small lots and carload trade in the near future. On a market fairly active and prospects good we make the following cash quotations, f.o.b. Chicago: Lake Superior Charcoal, \$18.50; Local Coke, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, \$16.50; American Scotch (Blackband), No. 1, \$18 @ \$18.50; Southern Coke, No. 1 Foundry, \$15.75; No. 2 Foundry and No. 1 Soft, \$15; No. 3 Foundry, \$14.50; No. 2 Soft, \$14; Gray Forge, \$13 @ \$13.50; Tennessee Charcoal, No. 1, \$19; No. 2, \$18; Alabama Car-Wheel, \$25.

**Bar-Iron.**—There were more than the usual number of good-sized orders circulating among the trade last week. Prices were asked on three or four orders, car specifications, several implement specifications, and on stock orders by dealers. Rumor has it that some of these were placed at rates which figure close to \$1.50, f.o.b. Chicago. Should this be true it would be an inside price, as manufacturers are asking \$1.45 for Common and \$1.60 for Single Refined at mill. Many manufacturers who are tired of unprofitable prices and striving to keep their mills employed on small trade refuse to quote on large and long-time contracts, thus giving the impression that the market is improving more force than a close investigation will justify. The market is certainly so very unsettled that it cannot be gauged by any of the recent transactions. This condition will probably continue through the month of June, or until the labor scale for next year is positively settled. From store jobbers are quoting from \$1.75 to \$1.95, according to quality, on small lots, which are in fair demand.

**Structural Iron.**—Prospects for better trade are slowly improving. Nearly every week adds a little increase to the volume of business, but prices are cut as close as ever. The high waters of the past week damaged many railroad bridges, and manufacturers are already counting on this as a source from which they will obtain orders for material immediately. The demand from country towns for building shapes is very fair. Being largely from standard sizes from stock secures to the seller a better profit than when he must bid against competition for an order. Mill lots f.o.b. Chicago are still quoted as follows: Angles, 2.12¢ @ 2.15¢; Universal Plates, 2.15¢ @ 2.20¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. From stocks small lots are quoted at 2.25¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees and 3.40¢ for Beams.

**Plates, Tubes, &c.**—Trade was not very brisk in Iron or Steel Plates last week. Consumers were taking only for present requirements in small lots, but the firmness displayed by mills in accepting orders made this a desirable condition of the market. Light-gauge Iron Plates are particularly firm, and to avoid taking further orders some mills have advanced their figures 5¢ per hundred above the market price or withdrawn entirely. Boiler Tubes are firm at the following quotations and another meeting of the manufacturers will be held this week with a view of making an advance in prices. We quote as follows from store: Nos. 10 to 14 Iron Sheets, 2.60¢ @ 2.70¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 57½¢ off for 1½-inch and less and 62½¢ off for 2-inch and larger.

**Sheet-Iron.**—The condition of the market continues to be very favorable to the seller. Consumers are making strenuous efforts to obtain supplies that were ordered some time back. Manufacturers appear to be utterly unable to keep up with the present demand, and still decline to accept orders for anything except lots of less than 100 tons, which are gauged in price according to quality and the mills' ability to furnish. Quotations on No. 27 range from 2.85¢ to 2.90¢ at mill. Store quotations on No. 27 are pretty firm at 3.10¢ @ 3.20¢, according to the quality of the Iron.

**Galvanized Iron.**—Trade was quite light in this branch of business. The demand was confined to small lots, and no important orders in sight. Stocks in the hands of dealers and agents are in good supply in all sizes. Jobbers continue the quotation of 65¢ off on Juniata and 65¢ and 5¢ off on Charcoal.

**Steel Rails.**—Negotiations for large blocks that were started several weeks ago are still open. The aggregate orders for May, it is said, will not exceed 15,000 tons. Small orders are coming in, but in such an irregular way that there is no certainty yet that the Illinois Steel Company will start up another of their mills this month. They continue to quote \$29 @ \$30 on the general run of orders. At this writing it cannot be determined what effect the misfortune of the Cambria Iron Company will have upon the market, if any.

**Merchant-Steel.**—The buyers who are looking for material to cover their next season's requirements were more numerous last week, and probably some orders were placed, either one of which would fill up some of the smaller manufacturers for the entire year. With the exception of the trade which comes from Harvesting-Machine manufacturers business has been chiefly for small lots of the better

grade of Steel. Soft Bessemer Steels are quoted at 1.80¢ rates at mill. Store prices on other grades are as follows: Mixed Machinery Steel, 2.10¢ @ 2.20¢; Tool Steel, 7.75¢ @ 8¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Track Supplies.**—Indications are that there will be a better business in this line very soon. There are more inquiries for Fish-Plates, Bolts, Spikes, &c., than there have been for several months past, but the whole does not aggregate anything very large in immediate business. In small lots Steel Fish-Plates are quoted at 1.90¢; Iron Fish-Plates, 1.70¢ @ 1.75¢; Bolts with Square Nuts, 2.50¢; Bolts with Hexagon Nuts, 2.65¢; Spikes, 1.90¢ @ 2¢.

**Old Rails and Wheels.**—There is quite an active demand for Old Iron Rails. Several lots, aggregating 500 to 1000 tons, changed hands at prices equivalent to \$19.50 @ \$20. Chicago stocks are light and demand increasing from Ohio and Eastern mills. There is very little doing in Old Steel Rails. Short lengths are quoted at \$15 @ \$16 and long lengths at \$17.50 @ \$19. There is no demand for Old Car-Wheels. Nominal price would be about \$16. Stocks are abundant and buyers wanted.

**Scrap.**—The accumulation of stock continues to be a feature of the market. Consumers are making a little more inquiry, but not buying in any quantity. Dealers claim that they cannot afford to shade prices any further, and it is doubtful whether any reduction they might make would be an inducement to purchasers. The majority of transactions for the week were in cheaper grades of material. Dealers quote to consumers per ton of 2000 lb as follows: No. 1 Wrought, \$17.50; Fish-Plates, \$18; Axles, \$22; Horseshoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plate, \$9; Cast Borings, \$8; Wrought Turnings, \$10.50; Axle Turnings, \$12; Mixed Steel, \$10.50 @ \$11; Coil Steel, \$13.50; Leaf Steel, \$15.

**General Hardware.**—Trade continues very active on Shelf Goods, Roofing Plates, Tools, Building and House-Furnishing Materials. Copper Sheathing and Copper Bottoms have been reduced 5¢ per 100. Shot have been advanced 15¢, and are now sold at \$1.10 per bag. Paper shells have been advanced from 33½¢ to 20¢ discount on sizes 4 to 12 inclusive on all grades except first quality. Standard Wringers are selling at a reduced price, on account of competition with new makes. The price on Axes is about 50¢ per dozen less than during this period last year. Sales during the past winter were very light.

**Nails.**—As predicted last week, the Nail market has gone to pieces, and large blocks are being thrown upon the market almost regardless of cost. The dissolution of the Western Association has engendered a reckless spirit which from a superficial aspect indicates that some of the manufacturers are going to sell out their stocks and quit the business or force some of their competitors to do so. Manufacturers' prices cover a wide range, and there is no telling what the bottom is. Jobbers are not inclined to name a price on carloads that they would be governed by under all circumstances, but from the general trade orders would be accepted at \$1.85 rates and small lots at \$1.90 rates, regular terms. Wire Nails have been advanced about 10¢ per keg on an average by manufacturers making 60d the base. This reduces the price on the small sizes and advances it on the larger sizes. Jobbers quote \$2.30 in carloads and \$2.35 in small lots.

**Barb-Wire.**—There is no change from the conditions reported last week. The

demand continues good for small lots, and mills are still working on orders. On Painted Wire from store 2.75¢ is quoted, and on Galvanized, 3.35¢. No concessions for carloads.

**Pig-Lead.**—The market has been quiet but firm. Sales of some 400 tons are reported at figures ranging from 3.75¢ to 3.80¢.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., June 4, 1889.

The disaster at Johnstown has absorbed the attention of the trade during the past two or three days, and as yet everything is unsettled, so that it is almost impossible for manufacturers to know where they stand. Apart from the great loss at the Cambria Iron Company's Works, there is the interruption to transportation and the uncertainty in regard to the supply of Coke, Soft Coal, &c. Then there is a possibility that smaller mills along the Susquehanna and at other points may be disabled for some time, so that it is impossible to form any definite idea of the immediate capacity for production, as mills not directly affected by the floods may be seriously embarrassed by the difficulty in obtaining supplies of various kinds. In the meantime those who are in a position to accept orders ask from  $\frac{1}{2}$ ¢ to  $\frac{1}{4}$ ¢ advance on Plates and Angles, and in fact more money is asked for nearly all kinds of Finished Iron. Until this terrible calamity occurred the entire market was beginning to show strength and activity, and it may be that the extraordinary turn of events may give an impetus toward a general advance. This article has to deal with things from a business stand-point, so that it will omit all other references. In doing so, it may be said that the trade are a little undecided as to the immediate course of the market. The impression is that it will cause an immediate stiffening in all kinds of Finished Iron and Steel, but it may not affect Pig-Iron. Finished Iron and Steel will be wanted immediately and in large quantities, while there will be a serious falling off in production. The Cambria Iron Company are not only out of the market, but the orders which that company had on their books will have to be placed elsewhere. Many smaller mills have doubtless been crippled so that they will not be in a position to do much until after mid-summer, while those that are able to run find their fuel supply in a most precarious position. These considerations naturally cause sellers to hesitate in naming quotations, as there is a possibility of an advance being started along the entire line. As regards Pig-Iron, the position is somewhat different. If the mills cannot run they will not need much Pig-Iron, but if the curtailment of the fuel supply affects the mills it must also to some extent affect the furnaces, so that the chances are that Pig-Iron will not accumulate to any extent; neither will prices be materially affected in either direction. Up to this time (Tuesday, p.m.) quite a number of the Philadelphia representatives of mills and furnaces have not yet been able to communicate with their principals, so that it is impossible to know what condition they are in; hence, so far as they are concerned, all business is in abeyance.

**Pig-Iron.**—As already stated, the market is unsettled, and prices feverish and irregular. There is a great deal of inquiry for Iron, but whether due to actual requirements or whether they are "feelers" can hardly be determined at present. The disposition among holders is to quote firmly at last week's quotations, and in no case to accept very large orders or to make concessions. This, however, may be only temporary, and perhaps preliminary to an advance, although that, of course, is mere

conjecture. As a matter of fact it is impossible to form any definite opinion in the present unsettled state of the market, although the general impression is that it will ultimately develop into higher prices. In the meantime it is difficult to place orders at the inside quotations, so that \$17 @ \$18, delivered, about covers the market for No. 1 Foundry, \$16 @ \$16.50 for No. 2 and \$14.75 @ \$15 for Gray Forge. Southern Irons are held firmly at \$15.50 @ \$16 for No. 2, and \$16.50 @ \$17 for No. 1, delivered in consumers' yards, with only moderate offerings at those figures.

**Blooms.**—The feeling in Steel Blooms is very firm, as quite a number of orders placed with the Cambria will have to be duplicated elsewhere. At the moment it is difficult to get firm quotations on large lots, but in a general way holders ask an advance on last week's prices, which were as follows: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 "Bloom" ton of 2464 lb.

**Muck Bars.**—There is more inquiry, but very few Bars are offered. Sales were made last week at \$27, delivered, but it would be difficult to get anything to-day less than \$27.50.

**Bar-Iron.**—In the absence of actual sales it is difficult to quote exact prices, although there is no doubt that they would be from  $\frac{1}{2}$ ¢ to  $\frac{1}{4}$ ¢ higher than they were a week ago. Manufacturers hardly know what figures to name on large lots, although their regular customers could probably secure moderate supplies at from \$1.75 to \$1.85 for best Refined Bars. There is a great deal of inquiry from consumers, but to what extent Bars may be actually required remains to be seen.

**Plate and Tank Material.**—Inquiries are numerous, and requirements will doubtless be very large during the next three or four months. Mills are already full of work, and are not quoting on anything additional, unless at advances of from \$1 to \$2 per ton or more. We repeat last week's quotations, although, as we have said, they are doubtless below what would be accepted to-day—viz., 1.90¢ @ 2¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.1¢ for Universal Plates; Shell, 2.3¢ @ 2.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.25¢; Shell, 2.5¢; Flange, 2½¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

**Structural Material.**—There is a great deal of inquiry to-day, and a large amount of business will undoubtedly be placed as soon as terms can be arranged. The mills are already pretty well employed, and the sudden demand likely to be thrown upon them will be likely to lead to a decided stiffening in prices. Quotations under present conditions are liable to be somewhat irregular, but to-day's figures are about as follows: Bridge Plate, 2.05¢ @ 2.10¢; Angles, 1.95¢ @ 2¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—The demand keeps up very satisfactorily, and while there is no change to note in prices, everything is held at last week's figures, viz.:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, $\frac{1}{4}$ ¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3½¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.67½ %

**Steel Rails.**—It is stated that a number of options have been accepted within the past few days, and that manufacturers are now asking advances of more or less importance. In this market \$28, at mill, is said to be a firm quotation, and under present conditions it is extremely doubtful if that figure could be shaded. The feeling in Rails and Steel of all kinds shows increasing firmness along the entire line.

**Old Rails.**—There is no apparent change in this department, although so far as known there has been no business whatever during the week. Buyers could be found at \$22.50 to \$23, delivered, but they are held for \$23 and upward.

**Scrap-Iron.**—Holders ask outside prices, and although transaction have been somewhat limited, the feeling is very firm at \$20 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$18 @ \$19; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The demand is very active and prices strong, with an upward tendency, although as yet discounts remain as before, viz.: Butt-Welded Black, 52½ %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52½ %; Boiler Tubes, 60 %.

**Nails.**—In sympathy with the rest of the market, the feeling is feverish and unsettled. It is difficult to quote prices to-day, but a general advance from the recent low figures appears to be pending.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, June 3, 1889.

**Pig-Iron.**—Neither buyers nor sellers of Pig-Iron in the local market have changed attitudes during the past week. The depression noted for several weeks has given place to a despondent tone in some quarters, while in other instances interested parties have simply deferred hope of improvement. Sellers attach much importance to the fact that four furnaces have blown out in the South, either because they could not or would not submit to the low prices current, but buyers are not slow to oppose the fact that three other furnaces in the same district have resumed operations during the week, so that there is little strength to be gained from the changes. But while prices have continued low, the volume of business has increased some. The very lowest prices which have been named have been either for small amounts or for near delivery, producers refusing to sell for long delivery at prices now current. Agricultural works have been especially anxious to place orders for round amounts for 8 to 12 months. There has also been some talk of Pipe works placing large contracts. Among the sales during the week were 1200 tons No. 3 Southern Foundry Coke Iron at \$13; 1000 tons Mottled at \$11.75, cash; 2500 tons of mixed grades Foundry Iron, of which 1000 tons were of Softeners, on basis of quotations; 1000 tons Gray Forge at \$12.75, and a few 100-ton lots at \$12.50. In addition sales of 2500 and 1000 tons were reported on Saturday. There has also been a better inquiry for Car-Wheel Iron. Most of the demand was experienced late in the week, so that the market closes under more favorable auspices than the facts recited early in the week would lead one to suppose. The fact is, with prices below the productive point, but little risk can be run by those in need of Iron for some little

time. The following are the approximate prices current here at the close for cash, f.o.b.:

#### Foundry.

Southern Coke, No. 1 (new classification).....	\$14.00 @ \$14.50
Southern Coke, No. 2 (new classification).....	13.50 @ 14.00
Southern Coke, No. 3 (new classification).....	13.00 @ 13.50
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 15.25
Mahoning and Shenango Valley.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 1.....	20.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1.....	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2.....	16.50 @ 17.00

#### Forge.

Strong Neutral Coke.....	12.75 @ 13.00
Mottled Neutral Coke.....	11.75 @ 12.00
Gray Forge.....	12.50 @ 12.75

#### Car-Wheel and Malleable Irons.

Southern Car-Wheel.....	20.00 @ 24.00
Hanging Rock, Cold Blast.....	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable.....	20.00 @ 21.00

**Manufactured Iron.**—An easy tone has prevailed, but in a few instances both mills and foundries have secured better orders, which is encouraging.

**Nails.**—The demand has been only moderate and the market easy, without further change in prices. Steel Nails, 12d and 40d, sell at \$1.80 @ \$1.90  $\frac{3}{4}$  keg, with 10¢ rebate in carload lots at the mills, and Steel Wire Nails at \$2.40 @ \$2.50  $\frac{3}{4}$  keg.

**Old Material.**—There have been moderate offerings of Old Rails, but little demand, at \$20, spot. Old Wheels have been in light demand, but small sales are reported at \$16, cash.

## St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st.,  
St. Louis, June 3, 1889.

**Pig-Iron.**—A better feeling prevails in this department. Inquiries for some good round lots have been received during the past week, and indications point to an increased demand at an early period. Everyone seems to think that bottom has been reached, and while prices may remain stationary for some time, they confidently expect any change will be for the better, and base their anticipations on the fact that a number of furnaces have blown out and those that are in blast are well filled with orders, while consumption is steadily on the increase. There are a few furnaces, however, that seem disposed to quote some very low prices, and until they have entered enough orders to keep them running it is useless to expect any advance in prices. On the other hand, there are those that express confidence in the future and refuse to meet these low quotations. For ordinary-sized lots we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75
Southern Coke, No. 2 Foundry, 14.75 @ 15.25
Southern Coke, No. 3 Foundry, 14.25 @ 14.50
Gray Forge..... 13.25 @ 13.75
Ohio Softeners..... 17.00 @ 19.00
Lake Superior Charcoal..... 19.75 @ 21.50

#### Missouri.

Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

#### Tennessee.

Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.

**Bar-Iron.**—Business is confined mostly to small orders, on which the mills are kept fairly well employed. The demand for iron for railroad work is on the increase, and the country merchants are purchasers of some fair-sized lots. Prices remain as last quoted, as follows: Small lots from store, \$1.80; Carload lots from \$1.60 to \$1.70, according to circumstances.

**Barb-Wire.**—Mills are fairly well employed and the demand seems in a fair way to keep up during the summer months.

The demand from the South and Southwest has been especially large, and mills have been running full time and have had no opportunity to accumulate any stock. Prices remain unchanged, but are quoted with considerable firmness as follows: From \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized; carload lots from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

## Cleveland.

CLEVELAND, June 3, 1889.

**Iron Ore.**—The amount of Ore now sold is estimated at 3,750,000 tons. Considerable Gogebic Ore at \$5  $\frac{3}{4}$  ton is being placed, and round lots of Minnesota Ore at \$5.75 are in demand. The market has not been particularly active during the week just closed, but furnace men at Pittsburgh and in the Mahoning and Shenango Valleys are beginning to buy quite liberally, and orders aggregating 500,000 tons may be expected from these districts within the next few days. A determined effort has been made to force up Lake freights, but the last charters reported were at the figures prevailing since the opening of navigation. It is possible that the Escanaba rate may be forced to \$1, but efforts in that direction will be vigorously resisted. Non-Bessemer Ores at \$3 60 @ \$4 are again selling quite freely, and the sale of 5000 tons of a special high grade of Bessemer Ore, containing less than 0.02 % of phosphorous, at \$6.25, f.o.b. vessels Cleveland, is reported. The receipts of Ore at Cleveland during May were 213,275 tons, and the shipments from the local docks to the furnaces were 90,092 tons.

**Pig-Iron.**—The faith of the furnace men in the early improvement of the market is exemplified by their liberal purchases of Ore at about the same prices paid last year, when their own products were quoted much higher than at present. The amount of Ore already sold is far in advance of the record up to a corresponding time last year. There has been a steady demand for iron during the past week, but the sales were confined to small amounts. Dealers believe, however, that the aggregate amount sold is in excess of the record for any preceding week in May. The following are market prices to-day:

Nos. 1 to 6 Lake Superior Charcoal.....	\$20.00 @ \$20.50
No. 1 Strong Foundry, Bessemer quality, $\frac{3}{4}$ ton.....	18.50 @ 17.00
No. 1 Strong Foundry, $\frac{3}{4}$ ton.....	18.00 @ 17.00
No. 2 Strong Foundry, $\frac{3}{4}$ ton.....	15.00 @ 16.00
No. 1 American Scotch, $\frac{3}{4}$ ton.....	16.50 @ 17.00
No. 2 American Scotch, $\frac{3}{4}$ ton.....	15.50 @ 16.50
No. 1 Soft Silvery, $\frac{3}{4}$ ton.....	17.00 @ 18.00
Mahoning and Shenango Valley Neutral Mill Irons, $\frac{3}{4}$ ton.....	14.00 @ 15.00
Mahoning and Shenango Valley Red Short Mills, $\frac{3}{4}$ ton.....	14.50 @ 15.50

**Manufactured Iron.**—The market is not active, but there is a demand for Common Bar at 1.60¢. Combination shapes are freely inquired for, but Steels are dull.

**Old Rails.**—A few sales of Old American Rails at \$21 are reported. Old Wheels are plenty but are not in great demand.

## Detroit.

WILLIAM F. JARVIS & Co., under date of June 3, 1889, report as follows: There is very little change in the situation here since our last report. While the buying is mostly confined to carloads and 50-ton lots, a few larger sales have been booked and inquiries for several thousand tons have been received, but as the prices buyers are offering are in most cases considerably lower than sellers will accept these inquiries may not result in immediate sales. As soon as buyers become convinced that prices have reached bottom there will be an active demand, and prices will at once become firmer and go higher. The number of Lake Superior Charcoal furnaces

that are out of blast will soon reduce any surplus there may be of this class of iron. Out of five furnaces in Detroit or in the near vicinity, with a total weekly capacity of about 1400 tons, three are out of blast and the two in blast have a weekly output of only about 400 tons, and there are several others in the State also idle. We report a quiet market, with prices as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.00 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.00 @ 19.00
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.00 @ 16.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.75
Old Wheels.....	18.50 @ 19.00

## Louisville.

LOUISVILLE, KY., June 3, 1889.

**Pig-Iron.**—There has been some change in prices during the last week, and some sales have been made for deliveries running through the year. Buyers in territory adjoining this district have also made purchases for their wants, extending through the season; and the indications are that where sales can be effected at present prices buyers are disposed to take hold and purchase for the next seven months' delivery. There is a scarcity of Bright and Silver Gray Iron where buyers desire immediate shipment. Of the new Southern furnaces which have gone in blast, Lady Ensley and Trussville are meeting with much favor. The Irons of both are strong and well graded. Lady Ensley is made of all-brown Hematite Ore and Pocahontas Coke. We quote as follows:

Southern Coke, No. 1 Foundry, new classification.....	\$14.25 @ \$14.75
Southern Coke, No. 2 Foundry, new classification.....	13.75 @ 14.25
Southern Coke, No. 3 Foundry, new classification.....	13.00 @ 13.50
Gray Forge.....	12.50 @ 13.00
White and Mottled, different grades.....	12.00 @ 12.50
Silver Gray, different grades.....	12.50 @ 13.50
Southern Charcoal, No. 1 Foundry.....	16.00 @ 16.50
" " No. 1 Mill.....	14.50 @ 15.00
Southern Car-Wheel, standard brands.....	21.75 @ 22.75
Southern Car-Wheel, other brands.....	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry.....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry.....	19.50 @ 21.00
Hanging Rock, Cold Blast.....	20.75 @ 22.75

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,  
CHATTANOOGA, June 3, 1889.

**Pig-Iron.**—The market is still in a waiting mood, and nearly everybody appears to think that improvement in prices will soon begin to appear. There is demand enough now, and judging from inquiries, which are more numerous than they were a month or so ago, better prices are not far off. The feelings of our Pig-Iron producers are much more hopeful than they have been in some time, and the impression seems to have gone forth that there is going to be a decided change for the better very soon. There seems to be just now a combination of circumstances that has induced such a feeling, besides the slight improvement that has already manifested itself. There has been during the past week much more inquiry than formerly, and there is a decided tendency manifested by buyers to make large contracts to extend all through the year, but without an exception producers are not listening to any such propositions, but are content to sell for deliveries only in the near future, and from now until the close of the present year there will be fewer long-time-delivery contracts made probably than at any time in the past. Notwithstanding the apparent depression in the Pig-Iron-producing business, the question of erecting new plants appears to be as active as ever. The subject of the manufacture of Basic Steel appears rather to have given an impetus to the

Iron question South, and the feeling is quite animated. The interest that is being taken in the Iron-making business South was never as much manifested as it is at the present time, and the question of Pig-Iron of the past and present is not so much talked of or thought of as the Pig-Iron of the future, and what it is going to be.

## New York.

Office of *The Iron Age*, 66 and 68 Duane street.  
New York, June 5, 1889.

The floods which have devastated a large part of Pennsylvania, extending into New York on the north and Maryland and Virginia on the south, seriously interrupted business during the past week. Railroad bridges were washed out by the score, embankments and trestles were destroyed, and for several days important industrial centers in Pennsylvania were wholly deprived of all communication with the surrounding country. Among the railroads the Pennsylvania system was the chief sufferer, the main line and some of the most important branches having been seriously damaged. The loss of life has been appalling, but in addition to that many large industrial establishments have been so nearly destroyed that for some time the dependent population will be without the means of earning a livelihood. The pecuniary loss attendant upon these most extraordinary floods for the time of the year will aggregate many millions of dollars. The only ray of comfort to be taken out of this calamitous condition of affairs is the necessarily heavy demand for materials which will be required to repair damages to railroads and other interests, making the Iron trade a prominent beneficiary.

**Pig-Iron.**—A great many inquiries are in the market and some heavy sales of Southern Iron are reported. The representatives of Southern furnaces state that their principals generally are notifying them to exercise caution in quoting for future delivery. Large consumers in the West have purchased so freely of late that in view of the decreasing output of Iron a reasonable hope is entertained of better prices in the near future. Some go so far as to say that the consumers who have steadily refused to make contracts for their future requirements will shortly find that they have waited too long for the market to touch bottom and that they have lost their opportunity to buy cheap. The low sale of Southern Iron at Cleveland reported in the daily press was not worth making a sensation over. The prices given was not an unusual one in the West and does not indicate further demoralization. Northern furnacesmen are also in better heart, as their customers are calling for prompt shipments on contracts, and the quantity of Iron moving is very large as compared with the output. Northern Iron is quoted at \$16.50 @ \$17.50 for No. 1; \$15.50 @ \$16 for No. 2; \$14.50 @ \$15.25 for Gray Forge, all at tidewater. Southern Iron is quoted at \$16 @ \$16.50 for No. 1; \$15.50 for No. 2 Foundry and No. 1 Soft; \$14.75 @ \$15 for No. 3 Foundry and No. 2 Soft; \$14.25 for Gray Forge, all delivered at New York.

**Scotch Pig.**—Nothing is doing in this line of any special consequence. Quotations continue as follows: Dalmellington, \$19.50; Summerlee, \$21.50; Coltness, \$21.75.

**Spiegeleisen.**—A temporary demand was experienced during the past week, but consumers generally are so well supplied that not much business is looked for at present. Importers quote 20 % at \$28; 80 % Ferro is in more regular demand, but in very small lots, at \$57 @ \$58.

**Bar-Iron.**—Only small orders have been taken at old rates—namely: Common, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.75¢ @ 1.9¢, for carload lots on dock.

**Structural Iron and Steel.**—Prices are firm in this class of material, and the decline seems to have been checked. Business is very good and promises to be still heavier. Quotations for delivery on dock are as follows: Sheared Plates, 1.95¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢.

**Plates.**—The market is strong, with a large demand. Locomotive builders are receiving more orders, and are purchasing quite freely. While no advance has been made as yet, the condition of trade has improved very materially, and manufacturers are not disposed to load up too heavily at present prices. Dock deliveries are quoted as follows: Iron Tank, 1.95¢ @ 2.1¢; Shell, 2½¢ @ 2.5¢; Steel Tank, 2.2¢ @ 2.8¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.65¢ @ 2.75¢; Fire-box, 3.25¢ @ 4¢.

**Merchant-Steel.**—A fair volume of business is in progress, but only small lots are moving. Prices are still badly demoralized. Good brands of Tool Steel, in large lots, are quoted at 7¢ @ 7½¢; specials, 12½¢ @ 20¢; Crucible Spring, 8½¢ @ 4¢; good Open-Hearth Machinery, 2.30¢ @ 2.5¢; common ditto, 2¢ @ 2.25¢; Open-Hearth Spring, 2½¢ @ 2.5¢; Sheet, 6½¢, 8½¢ and 10½¢.

**Steel Rails.**—The sales made in the past week aggregate about 25,000 tons. A number of round lots are being negotiated, and inquiries have grown a little more frequent, buyers doubtless anticipating an advance in price in consequence of the improved condition of the mills. The manufacturers are helping along this feeling by quoting \$27 at mill and insisting that they intend to make it their bottom rate. The disaster which has overtaken the Cambria works is not without its effect also. That mill is not only out of the race for an indefinite time, but it will probably be obliged to distribute its orders among the other Rail companies.

**Track Supplies.**—Large orders are coming up in the wake of the heavy Rail contracts recently made, but thus far it is not known that any of them have been placed. Quotations for Fish-Plates continue at 1.80¢ @ 1.90¢; Track Bolts, Square Nuts, 2.70¢ @ 2.75¢; Hexagon Nuts, 2.80¢ for Common Iron and 3¢ for Refined; Spikes, 1.90¢ @ 2¢.

**Old Material.**—A better feeling is reported with regard to Old Rails and Scrap, in consequence of the growing inquiry. Consumers bid \$22 for Old Rails, but holders are not willing to sell at that figure. For No. 1 Wrought Scrap \$20 is bid, but \$21 is asked. Other Old Material continues dull at about \$13.50 @ \$14 for Turnings, delivered; \$15 @ \$16 for Cast Scrap, and \$9.50 @ \$10 for Cast Borings.

**Wire-Rods.**—A little inquiry for prompt lots is reported, due probably to the cutting off of the Cambria supply. Foreign Rods are very high, owing to the German labor troubles, which still continue, and most makers abroad are unwilling to quote. Prices are now ranging at about \$42.50, New York.

**Blooms and Billets.**—No business is doing in foreign. An inquiry for Basic Billets elicited a quotation of \$33.50, export, which was too far above competing domestic Billets to lead to a sale.

Messrs. Naylor & Co., 99 John street, New York, have issued the following circular letter, under date of June 1: "Referring to the annexed circular of the Tennessee Coal, Iron and Railroad Company, we are now ready to receive orders for

Pig-Iron manufactured by that company, and shall be glad to be favored with your inquiries at our offices in New York, Philadelphia and Pittsburgh." The circular of the company, which is dated at Nashville, Tenn., June 1, is as follows: "We have arranged with Messrs. Naylor & Co., New York, to sell the Pig-Iron manufactured by this company in New England, Pennsylvania, New Jersey, Delaware, Maryland, Virginia and the cities of Wheeling, W. Va.; Louisville, Ky.; Jeffersonville, Fort Wayne and Lafayette, Ind.; and Chicago, Hegewisch and Pullman, Ill.; and we shall be glad if you will address all inquiries after this date to them or their houses in Philadelphia and Pittsburgh. All sale contracts will be signed by Messrs. Naylor & Co. in the name of the company, as its agents. All payments are to be made direct to Messrs. Naylor & Co., who will give receipt for them in the company's name."

## Financial.

For the time being all thoughts are absorbed by the catastrophe in Pennsylvania, the number of whose dead Governor Beaver computes at something like 10,000, while the property loss is between \$25,000,000 and \$40,000,000. Maryland losses, according to some estimates, \$5,000,000, and several millions more must be added for property destroyed in New York and Virginia. To a large extent these figures represent the destruction of bridges, factories and lumber. A cheering feature is the enthusiasm everywhere shown in extending relief to the sufferers, all the mercantile exchanges in New York being among the contributors, besides corporations, bankers and individuals. The Reading Company send \$25,000, and Philadelphia promises \$500,000 by Saturday night. Half of the Reading's 40 collieries were flooded, but will be restored within a week. The suspension of mining in all the anthracite region is interrupted by damage to breakers and other colliery machinery, and transportation in the mining regions will be seriously embarrassed for several days.

An event of the week was the sale at auction by jobbers of \$3,500,000 worth of flannels at an advance of 5 % on prices over those of last year, though not commensurate with the increased cost of wool. The effect was to strengthen confidence in values. Alex. McKay, general freight agent of the Michigan Central, and five of his subordinates were indicted by the United States Grand Jury, at Chicago, on Saturday, for violation of the Interstate Commerce law in giving a shipper a rebate on grain rates. It is the most important action since the passage of the Interstate law, showing that the commission has stopped advising and is now inflicting penalties.

The Stock Exchange markets were considerably affected by advices from Pennsylvania. The stock of the Cambria Iron Company, which has been badly stricken by the calamity, is strongly held. On Monday in Philadelphia more of this stock was offered, showing the stockholders not to be much disturbed, but in New York it dropped from 250 to 50. The Cambria Company, with \$4,000,000 capital, the *Press* says, "have assets valued at figures approximating \$12,000,000. The Johnstown plant, while valuable, was comparatively only a small part, and the losses, estimated at \$2,000,000 to \$2,500,000, even with the loss of traffic and business until work is resumed, can be deducted and still leave a most valuable property." In Wall street the market was weak and irregular under the pressure of realizing sales. The silencing of the stock tickers by order of the Governing Committee, it is hoped, will be effective in stopping the



"bucket-shop" business. Government bonds were steady. Sales of \$5000 coupon 4s were reported at the board at 129½. The Treasury accepted \$80,000 4½s at 106½. Quotations as follows:

U. S. 4½s, 1891, registered.....	106½
U. S. 4½s, 1891, coupon.....	107½
U. S. 4s, 1907, registered.....	128
U. S. 4s, 1907, coupon.....	129
U. S. currency 6s.....	119

On Tuesday stocks were generally strong. The announcement was made that the Southern Pacific had not left the Transcontinental Association, and would continue to work in harmony with the other roads, but in competition with the Canadian Pacific. The coalers were not much affected by the news from Pennsylvania. Although the number of collieries drowned out is large, particularly in the Mahanoy and Centralia regions, it is likely that the mines whose operations are not seriously impaired by the flood will be worked so as to make up for the stoppage of production by others. It was reported that \$750,000 more in gold had been ordered for Wednesday's steamer, and that shipments to the extent of \$5,000,000 to \$10,000,000 during June are not improbable.

General trade is hardly satisfactory, although the Clearing-House returns from 39 cities show an increase of 22.8% in the volume of transactions, indicating considerable activity. New York gained 35.6%, Boston 12%, St. Louis 19.3%.

In breadstuffs there is a heavy feeling, with easy figures for some grades. Holders of wheat are less eager to sell. Corn is firmer on reports of damaging rains in the West. Exports of wheat for the week from the United States comprised 350,000 bushels and of corn 1,570,000 bushels. Coffee is dull. Cotton is steady at ½¢ advance for spot on fair demand. Provisions are in demand for export at steady prices. Sugars are advanced ½¢ all round, and business is fairly active. Teas are firm. Tobacco steady. In ocean freights there is increased urgency in the demand for tonnage, in good part for petroleum, lumber, timber and grain.

The weekly bank statement of Saturday showed a decrease of nearly \$500,000 in surplus, but the gold shipped on that day was not reflected. Loans were contracted \$714,900, specie decreased \$1,792,500, legal tenders were up \$1,422,100. Time loans are 2½% for 60 @ 90 days, 3 for four months and 4 @ 4½ for the remainder of the year, but lenders are indisposed to make contracts maturing after October. The supply of commercial paper is limited. Rates are 3 @ 3½% for 60 @ 90 day indorsed bills and 4 @ 5½% for longer dates. Of the June interest and dividend disbursements the railroads pay out about \$24,000,000, and the General Government \$1,670,000 as interest on the 4½%. The semi-annual disbursements payable in Boston in June amount to \$5,534,764, as compared with \$4,890,410 last year.

Sterling exchange is firm, with posted rates at \$4.88 @ \$4.90. Gold to the amount of \$3,896,704 went to Europe on Saturday, chiefly to the Continent, the Paris and Berlin rates enabling exports to be profitably made. According to the Custom-House reports the exports of specie from this port during the week were \$4,107,653, making a total since January 1 of \$31,775,000, as compared with \$17,096,000 for the same time last year. The imports were \$257,000.

The imports of merchandise at this port during the week were valued at \$10,029,700, of which \$2,171,000 represents dry goods. Since January 1 the total valuation is \$216,306,000, against \$204,881,000 for the corresponding period last year and \$200,200,000 in 1887.

The Signal Service weather crop bulletin reports that low temperature, local frosts and excess of rain operated unfavorably

upon the crops in the States north of the Ohio River. The recent heavy rains, however, were beneficial in relieving the drought in the cotton States, and also improved the agricultural outlook in Kentucky, Tennessee, Arkansas and Texas. Harvest prospects are believed to be better than a year ago.

The new iron rate between Youngstown and Chicago, which goes into effect June 8, 15¢, is the lowest in eight years. At a meeting of the freight agents of all railroads of Detroit and Toledo, held at Toledo on Tuesday, rates were fixed at a figure that will allow the Eastern iron mills to compete with the Chicago reduction. The principal rates fixed were: Youngstown to Chicago, 9¢ in carload lots; Toledo to Chicago, 7¢; Cleveland to Chicago, 8¢; Toledo to Indianapolis or *vice versa*, 7¢; Toledo and Cleveland, 5¢. Nothing definite has been accomplished thus far in the attempted adjustment of the Oregon Railway joint lease and other matters affecting Pacific Coast connections. An important change in freight rates has been announced to take effect on June 10 between New York and New Orleans.

## Metal Market.

**Copper.**—Spot Copper improved for the week in the London market from £41. 2/6 last Wednesday to £41. 12/6 yesterday, and futures from £41 to £41. 5/, with sales of 1800 tons all told. Statistics showed an improvement on the 1st inst., the visible supply in England and France having decreased from May 1 some 7000 tons, the deliveries in these countries aggregating 13,900 tons for May, which shows a good revival of consumptive inquiry. The London *Economist* of May 25 prints a very sensible editorial on the general Copper situation, winding up with the following paragraph: "As a matter of fact we fail to see how any good can be effected by a combination of producers. We believe that the Copper market had better be left free to seek its own natural level. If this be done, those who at present hold large stocks of Copper may find it expedient or may be forced to realize; but that would be a decided gain, for then the metal would the more quickly pass into consumption under the stimulus of low prices. After such a liquidation the position would be comparatively healthy and Copper producers, after a short period of difficulty, would reap a permanent advantage." The Boston and Montana mine made the largest product in its history in May, getting out 2,520,100 lb of Fine Copper and 88,000 ounces of Silver. The whole figured at a gross value of \$325,000, and all expenses at not over \$200,000. The total product thus far in the fiscal year (11 months) is 21,630,553 lb of Copper and 116,782 ounces of Silver, against 7,000,000 lb of Copper and no Silver at the same time last year. There has been no change in our own market, the nominal quotation for Lake Ingot being 12½¢ @ 12½¢, and 11¢ @ 11½¢ for casting brands, while at 12¢ the regular customers of the mining companies continue being supplied by them. June sold at 12.10¢. The Mansfield Copper Company, of Eisleben, Germany, produced in 1888 13,579 tons Fine, being 356 tons in excess of 1887.

**Tin.**—Has followed a downward course once more in London, giving way from £92 last Wednesday to £91 with spot yesterday, and futures from £92. 17/ to £91. 15/. This decline was all the less expected, since the visible supply in Europe and America on June 1 showed a decrease of 1140 tons when compared with that of May 1. London sales for the week, 600 tons. Our own market followed suit all the more readily, as the comparatively light consumptive demand is confronted by a superabundance of available Tin of-

fering. June was sold down to 20.40¢, August from 20.55¢ down to 20.45¢, the latter and spot being obtainable at 20.35¢ last night. Our market to-day closes dull and uninteresting at nominally 20½¢ on the spot. **Tin-Plates.**—There has been no particular change since our last report, the moderate demand being met by dealers slightly under importers' price. We do not alter our quotations. On the other side there is a difference of about 3d per box between makers and buyers; should the former yield quite a large business would doubtless be done. We quote large lines, ordinary brands, per box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.25 @ \$4.35, and Wasters \$4.12½ @ \$4.15.

**Lead.**—Sales for the week in the open market sum up to 400 tons at 3.92½¢ to 3.97½¢, the closing figure being 4¢, and as much as 4.10¢ asked. St. Louis has been strong, advancing to 3.85¢ @ 3.90¢.

**Spelter.**—The demand being good and the supply to meet it barely sufficient, Common Domestic Spelter has further improved, and is now held at 5¢, a sale having been made yesterday at 4.90¢. Silesian is unchanged, 5½¢. High-priced Ores, Coal and higher wages in Germany lend strength to the position out there.

**Antimony.**—The notable advance in London has caused an improvement here to 13½¢ for Hallett and 14½¢ @ 14½¢ Cookson, at which a moderate consumptive demand is being supplied.

## New York Metal Exchange.

The following sales are reported:

FRIDAY, May 31.

32 tons Lead, August.....	3.9¢
16 tons Tin, September.....	3.95¢

MONDAY, June 3.

10 tons Tin, June.....	20.40¢
25 tons Tin, August.....	20.55¢
25 tons Tin, August (2d half).....	20.45¢
16 tons Lead, August.....	3.95¢
50 tons Lead, spot.....	3.95¢
50 tons Lead, spot.....	3.95½¢

## Coal Market.

The New York market for Anthracite is dull and quiet, few sales being reported at the advanced schedule which took effect on Saturday. The future is largely dependent on the extent of damage from the disastrous floods, respecting which there are numerous telegrams, with little definite information. At Shamokin all the collieries were forced to suspend and, many were drowned out. All the collieries in the Mahanoy Valley and at Centralia are drowned out to an extent that will incapacitate them for work at least two weeks. One account says that only 20 of the 40 collieries of the Reading Company are in operation. At Hazleton the work of getting out Coal is stopped. Some of the collieries are completely drowned. Lattimer No. 3 and Mt. Pleasant No. 1, belonging to A. Pardee & Co., are said to be in the worst condition. At Carmel, where 6000 hands are employed, work in two large mines is indefinitely suspended, nearly all the pumps being under water. At Ashland not a single colliery in a list of nearly a score but is drowned out and much of the machinery is submerged. Gigantic pumps make no headway against the water. In the Pine Grove regions the collieries are filled with water. Every mule at Brookside Colliery, the largest of the Philadelphia and Reading Coal and Iron Company collieries, was hoisted. No coal trains are able to reach the collieries. The announcement is made that the Chesapeake and Ohio Canal had been irreparably damaged and will be abandoned. This means that its Coal business from the Cumberland region will now be divided

among the railroads leading to tidewater. A dispatch from Corning, in this State, referring to the floods, says the Fall Brook Coal Company lose heavily—that “\$1,000,000 will not cover the loss.” Added to other embarrassments in the mining regions, transportation is interrupted, so that at least a week must elapse before the Coal trade can be restored to anything like normal conditions. Meanwhile supplies at tidewater are sufficient for the emergency. The reported production for the week is 608,552 tons, a decrease of 100,000 tons compared with the previous week, but an increase of 64,000 tons compared with the same week last year. Since January 1 the total is 12,129,813 tons, a decrease of 1,393,000 tons compared with 1888. Quotations, Free Burning, f.o.b.: Broken, \$3.85; Egg, and Chestnut, \$4; Stove, \$4.80.

The Bituminous Coal trade is somewhat improved, but there is no radical change. Supplies will be diminished by the floods, but no scarcity is apprehended. The Cumberland Coal shipments aggregate 56,000 tons, Tyrone and Clearfield 48,000. The scarcity of vessels continues.

The Philadelphia *Inquirer* says: “The new Lehigh and Wilkesbarre Coal Company's mine at South Wilkesbarre will be started up on June 8. It is expected to be one of the largest producers in the region.”

Coxe Bros. & Co. are putting down a large colliery in the Schuylkill region, near Green Mountain.

The Pennsylvania Railroad Company announced a reduction in tolls on Buckwheat Coal and Culm to New York Harbor of 10¢ a ton, which will go into effect on June 21. The total reduction on these sizes is now 50¢ below domestic sizes.

## Imports.

### Hardware, Machinery, &c.

Almgult, A. W., Mach'y, cs., 54  
Barbour Bros. & Co., Mach'y, pkgs., 14  
Baker, Hermann & Co., Chains, cks., 37; Arms, cs., 52  
Field, Alfred & Co., Mdse., cs., 23  
Godfrey, Chas. J., Arms, cs., 18  
Graef Cutlery Co., Cutlery, cs., 6  
Hartley & Graham, Mdse., cs., 12  
Lundborg, G. G., Iron-ware, bxs., 8  
Lau, J. H. & Co., Mdse., cs., 4  
Lewis & Conger, Knife Machines, cs., 5  
Mereh. Deep. Co., Mach'y, cs., 14; Arms, cs., 4  
Morris, L. W. & Son, Mach'y, case, 1  
Outerbridge, A. E. & Co., Propeller, 1; Brass Tube, 1  
Schoverling, Daly & Gales, Arms, cs., 3  
Sacks & Richmond, Nails, cks., 4  
Taylor, Thos., Mdse., cs., 5  
Tate, Muller & Co., Mach'y, case, 1  
Wiebusch & Hilger, Lim., Mdse., cs., 60  
Witte, J. G. & Bro., Cutlery, cs., 4; Guns, cs., 7

Walter S. Ottinger, of the Cambria Works, says that “John Fulton, general manager of the Cambria Iron Works, who is drowned, was one of the best men that ever lived. As an engineer he was superb, and as a Christian no man was purer or better. He could handle men as well as any other man in Pennsylvania.” Charles T. Butler, assistant cashier, and John S. Buchanan, superintendent of the warehouses, are also among the victims.

Machinery that is intended to revolutionize the present mode of propelling boats is now being built for a boat of about 300 tons register that lies at the foot of Twentieth street, Brooklyn. The inventor, Dr. Jackson, says he is spending \$10,000 a week in perfecting his ideas. Much secrecy is maintained, but it is said that the force to be used is hydraulic. The Worthington Pump Company are building a steam pump for the boat, but they have been delayed, it is said, by finding that ordinary metals are not strong enough to resist the pressure that will be exerted. They, however, have decided to try cast steel. It is alleged that the builders expect to realize a speed of 30 miles an hour with ordinary vessels.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 5, 1889.

Merchant-Bar Copper, while fluctuating somewhat irregularly in price, has ruled quite strong. Early in the week an advance was caused by reports that an agreement had been arrived at in Paris. This was followed by some reaction due to realizations, but subsequently prompt sold up to £41. 10/, and the market closes strong. The fact that only a moderate quantity out of the large stocks on hand is offered tends to sustain values, particularly for named brands. Large purchases of forwards are said to have been made privately. There is a report that the recent interviews between mining delegates were unpleasant, resulting in the refusal of some companies to enter a fresh combination. The sale is reported of 200 tons Montana Matte, terms private. Among other important transactions the past fortnight 600 tons Yellow Metal and 1000 tons India Sheets are reported.

The demand for Tin has improved, but prices have ruled irregular in the face of that fact and the decrease in visible supply. Sales of prompts have been made at as low as £91. At the Dutch sales 24,200 slabs Banca and 1000 Billiton sold at an average of £92. 15/ in Holland.

Tin-Plate has been in rather better demand the past week and heavy shipments to the States are reported. Prices are, however, no better. Two new mills are being added to the Vernon works.

Pig-Iron warrants have been firmer, and the “bears” are manifesting uneasiness. It is stated that large orders have been placed in the hands of brokers to purchase should prices further decline. High prices for Coke have increased the cost of production and will cause Cleveland furnaces to be damped unless rates advance. The masters are determined not to produce at a loss. One Tees firm has stopped deliveries of Bilbao Ores. Maker's brands of Scotch, while 6d to 1/6 lower than last week, have met with freer sale, as has also Middlesborough at about 6d decline. Hematites are strong and more active also.

The effect of the Staffordshire combination is watched with considerable interest in Wales, where a similar organization may be formed. Welsh Bars are 2/6 up this week, but other Manufactured Iron is unchanged.

Steel of all descriptions continues strong, and prices generally are higher, including 2/6 advance on Rails and Blooms and 10/ rise on Wire Rods. Makers ask £6. 10/ upward for the latter.

High prices have been paid for Old Material during the week, and Rails are said to be scarce at the present time.

Scotch Pig.—There has been a more active business, but at irregular and rather lower prices.

No. 1 Coltness, f.o.b. Glasgow	54/6
No. 1 Summerlee, “	55/
No. 1 Gartsherrie, “	51/8
No. 1 Langloan, “	53/6
No. 1 Carnbroe, “	46/
No. 1 Shotts, “ at Leith	52/6
No. 1 Glegarnock, “ Ardrossan	51/6
No. 1 Dalmeilington, “	45/
No. 1 Eglinton, “	43/

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

Cleveland Pig.—At a further reduction in prices there has been a larger trade and the market is firmer. No. 3 Middlesborough, G.M.B., quoted 88, prompt.

Bessemer Pig.—Trade has been quite brisk and the market is decidedly firmer. West Coast brands, mixed numbers, 49/6, f.o.b. shipping point.

Spiegeleisen.—For this material there continues to be a firm and fairly active market. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

Steel Rails.—The market strong at 2/6 advance, and the demand fairly active. Heavy sections quoted at £4. 15/, and light sections £5 @ £5. 2/6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Makers ask 2/6 advance, but sales are not large. We quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There has been a good business at slightly under previous nominal prices. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—The market for these continues quiet but steady. Bessemer, £4. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—Demand only fair, but prices firm, owing to light stocks. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

Scrap-Iron.—A fair demand and prices steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

Crop Ends.—Business moderate and prices unchanged. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

Tin-Plate.—The market has been rather more active, but prices show little change. We quote, f.o.b. Liverpool:

1C Charcoal, Allaway grade	15/3 @ 15/6
1C Bessemer Steel, Coke finish	12/6 @ 12/8
1C Siemens “	14/ @ 14/6
1C Coke, B. V. grade	13/ @ 13/6
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—In this line there continues to be a fairly active trade at firm prices. We quote, f.o.b. Liverpool:

Staff. Marked Bars	£ s. d. @ £ s. d.
“ Common	6 0 0 @ 6 0 0
Staff. Bl'k Sheet, singles	7 12 6 @ 7 15 0
Welsh Bars (f.o.b. Wales)	5 5 0 @ 5 7 6

Copper.—The market fairly active and stronger, particularly for named brands. To-day's prices for Bars were £41. 10/, spot; £41. 5/, three months' futures. Best Selected, £47.

Tin.—A fair business done but at irregular and lower prices. Straits quoted to-day at £91, spot, and £91. 10/ for three months' futures.

Lead.—The market barely steady and rather slow. Quoted £12. 6/ for Soft Spanish.

Spelter.—There is less doing but prices remain firm. Quoted at £18 for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	36.9
Witels (Portugal)	\$1.08
Witels (Brazil)	\$4.6
Mark (Germany)	23.8
Kilogram	Pounds
Picul	134.

### GERMANY.

HAMBURG, May 25, 1889.—Iron.—The Rhenish-Westphalian Iron market displays great firmness. The gigantic coal miners' strike

took a good many iron works by surprise, their stock of coal being light, and several had to stop work in consequence for the moment. The effect on iron has if anything been a stiffening one. Some more blast-furnaces may be blown out, and this is all the more to be regretted, as both production and consumption of Pig-Iron has of late been very brisk. Stocks of the latter are reduced to 50,000 tons, showing that the larger production of the last few months has been absorbed. The largest reduction of stock has been in Forge Pig, but Foundry Pig has also been somewhat reduced; Thomas and Bessemer less so. All rolling-mill products and railroad material remain unaltered. The quotation for Wire-Rods is 110 @ 120 marks  $\frac{1}{2}$  ton, and that of Steel Rails 120 @ 125 marks.—*Borsenhalle*.

#### BRAZIL.

PARA, May 28, 1889.—*India Rubber*.—Two steamers with together 200 tons of Rubber on board have just left for the United States, having absorbed all the available supply on the spot May 31. The total receipts in May at this port were 620 tons Fine and 680 tons Ordinary.—*Per cable direct*.

#### CHILI.

VALPARAISO, March 29, 1889.—*Copper*.—The news per cable of the collapse of the syndicate and of the decline to £35 in consequence thereof has put a stop to dealings for export here. At a similar figure Copper production would not leave a margin in this country. *Coal*.—Copious arrivals from Australia have caused a drop to 25/, while Newcastle on the spot is worth 34/6 and floats thereof are firmer. *Exchange*.—There has been quite a decline, to 26 $\frac{1}{2}$ d, 90 days' sight on London.—*Weber & Co.*

#### EAST INDIES.

SINGAPORE, April 23, 1889.—*Tin*.—Our last report was dated 9th inst. Only a moderate business has been done in the majority of our staples, and there are no signs of any increase in the near future. Financial difficulties in France have had a depressing effect on this metal, and the fortnight's business totals only 160 tons at prices ranging from \$35.80 to \$36.35  $\frac{1}{2}$  picul. Stocks are not large, and we hear of nothing that justifies any change in the estimated production for the year. The closing price is \$35.60  $\frac{1}{2}$  picul with buyers. During the first quarter there were shipped from the Straits Settlements to the United States 31,523 piculs of Tin, against 10,014 tons during the corresponding period of 1888; 23,954 in 1887; 15,471 in 1886; 8406 in 1885, and 15,724 in 1884. Since then the steamer Prometheus took hence for New York 3785 piculs and the Ganges 3788. *Gum Copal*.—Continues firm, partly because there is a fair demand for good quality, but chiefly because prices are not yet at the level that will induce a large holder to make contracts. There have been no arrivals to speak of. *Gum Damar*.—Nothing has been done beyond a few small sales of low quality. Palembang has changed hands for Continental requirements. Very little of this article now comes to Singapore. *Tonnage*.—Rates are weaker and we look for some future decline shortly. Room offers freely for next month's shipment, but for this month's loading 37/6 for dead-weight is the best practicable so far. *New York via Cape*.—No change. News is just at hand of the loss of the Norway. *For Boston* the Obed Baxter has sailed. *Exchange*.—Is steady at 3/1 $\frac{1}{2}$  for six months' sight credit drafts.—*Giffman, Wood & Co.*

MANILA, May 27, 1889.—*Hemp*.—There are buyers at \$14.50  $\frac{1}{2}$  picul, against \$8.37 $\frac{1}{2}$  same date last year, equaling  $\frac{1}{2}$  ton, cost and freight, £46.10/, against £28.5/6. Since last cable there were no clearances for the United States, against 6000 bales last year; since January 1, 109,000 bales, against 76,000; there remain loading for the United States, 23,000, against 15,000; cleared for England since January 1, 107,000 bales, against 184,000; loading for ditto, 14,000, against 8000; cleared for all other ports, 18,000, against 34,000; receipts at all ports since last cable, 6000, against 22,000; ditto since January 1, 251,000 bales, against 249,000 in 1888 and 188,000 in 1887. *Freight*.—\$7.50, against \$5.50. *Exchange*.—Six months' sight, 3/5, against 3/5.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

#### RUSSIA.

ST. PETERSBURG, May 23, 1889.—*Petroleum*.—The Government has at length taken a favorable view of the pipe line which a private company propose to lay for Naphtha conveyance between the Caspian and Black Seas. The cost of it is estimated at 30,000,000 rubles, and the Government has been petitioned by the company to guarantee 3% per annum interest on a bond issue to be made of 14,000,000 rubles,

but the Finance Minister is opposed to this guarantee, but even without the latter the line will be laid.—*Journal de St. Petersburg.*

#### Teal's Portable Hoist.

The Committee on Science and the Arts of the Franklin Institute, Philadelphia, submitted a report on May 1 relative to Teal's portable hoist, from which we take the following extracts:

There are several well-known differential hoists in the market, but they all differ widely from Teal's invention. In all other hoists known to us, the overhauling or lowering of the hook is a mere reversing of the hoisting action and requires the same time as to lift a load, there being in them no provision for applying power to any other part of the hoist than that by means of the hand-chain by which the lifting is done.

The Teal hoist, on the contrary, has a slow and powerful motion to lift its load by means of the hand-chain and a quick movement for overhauling the chain and lowering the hook for a second lift by a pull directly upon the lift-chain. Supposing the convenient velocity in pulling the two chains to be the same, then in the 1000-pound hoist examined by us the hook can be overhauled five times faster by a pull upon one side of the lift-chain, or six and seven-tenths faster by pulling on the other side, than it can be by the hand-chain. This increases the capacity and usefulness of the hoist, and is therefore a valuable improvement.

The extent of this improvement is shown in a table which gives the velocity ratio and overhauling speed of several well-known hoists, with the ratio of increase in the Teal hoist. The general arrangement and workmanship of the hoist is good. The journals are made self-oiling by having a chamber filled with fibrous packing combined with each journal, and while we think some parts of the malleable-iron framing could be with advantage increased in weight and strength, we regard it as, upon the whole, an excellent hoist, with such novelty and advantage as fully entitle it to receive an award from the committee. The results of the tests made by the committee are given in such a manner as to enable a comparison to be easily made with those obtained by the committee appointed by the judges of group No. 136 of the Novelties Exhibition of 1885 on portable hand-hoists. In view of the very high efficiency of the hoist, showing a considerable increase over the best one then tested, and in view of the increase of capacity and speed in overhauling, the committee recommend the award of the John Scott legacy premium and medal to Chas. A. Teal for his invention.

#### Selling Galvanized Iron by Weight.

A week ago, says *The Metal Worker*, we indulged in a little editorial musing in the Roofing and Cornice Department concerning the practice of designing galvanized iron by gauge and the many objections there are to this system of describing sheets. We pointed out that sheet-copper is sold according to weight per square foot, and that, therefore, the roofer or cornice-maker who employs the latter material knows exactly what amount of surface a certain number of pounds of copper will cover, while if it were galvanized iron that was used for the purpose the amount could not be accurately determined. The weight of galvanized sheet per square foot has no fixed relation to the gauge under which it is sold, the reason being that the commercial gauge marks themselves are only a roughly approximate designation of thickness. The evil arising from the present indefinite system of marking is not confined to

mere annoyance, but often amounts to an actual financial loss on a contract, due to mistakes in estimating the quantity of material needed. The suggested remedy was very simple, and consisted in adopting the practice of selling galvanized iron by weight, the same as sheet-copper. We did not expect to see our advice followed immediately, for hitherto we have had to wait a long time before any effort was made toward changes that we had suggested. In the present instance, however, we have been agreeably disappointed, for, as will be seen by this week's advertisement of a prominent metal-house, any one in need of galvanized iron is enabled to buy sheets that are guaranteed not to exceed a given weight per square foot. Under this system the manufacturer has only to determine the superficial area of his work and to decide upon the thickness of the iron he wishes to use (which is given both in wire gauge and decimals of an inch), when by means of the table furnished by the dealer he can readily calculate the number of pounds of galvanized sheet-iron required. We are well satisfied that this innovation will commend itself to the trade, and, furthermore, we believe that the practice will in time be followed by other supply-houses and rolling-mills until selling galvanized sheets by weight becomes the common system.

#### Joints in Cast-Iron Pipe.

The attention given not long ago to the testing of soil-pipes brought to notice the methods employed for making joints between sections of cast-iron pipe. The two joints in most common use are the calked lead and rust joints, the former being the popular one in plumbing-work. When the pipe, from any cause, is subject to considerable variations of temperature the lead joint is liable to become leaky through the unequal expansion and contraction of the two metals. Never mind how tight the ring of lead is driven into the hub, the irresistible force of heat will in time loosen it and break the hermetic seal. This objection is overcome by packing the joint with iron filings wetted with water or some corrosive liquid that by its rusting action expands the filling and makes a close and permanent joint. The reasons that the latter method is not more often followed are the difficulty of properly preparing the cementing material and the fact that pipes so joined cannot be separated without breaking. The rust joint is permanent in the last degree, so permanent, indeed, that a sledge-hammer is the readiest instrument with which to effect its disarticulation. It seems strange that the inventive genius of the age has not better solved the problem of cast-iron-pipe joints, and that people are still confined in their choice between what may be tersely described as an imperfect method and an impracticable method. So long as the cast-iron pipes are made in their present form the joints will have to be filled with a cementing material of some sort. A filling of possible usefulness for this purpose is referred to by one of our foreign exchanges in describing a new method of making a joint between rough surfaces of cast-iron. The cement is simply mineral asbestos mixed with white lead to the consistency of a stiff putty, and has been successfully employed for closing cracks in cast-iron gas retorts. This compound, besides making a tight and permanent joint, will, it is said, resist any amount of heat, and is unaffected by steam or water. Let it be understood that we do not recommend plumbers to use this asbestos cement without trial, but simply tell them what is told us, and they in turn may do what they please with the information.

## Hardware.

Trade continues in fair to moderate volume, and is perhaps about as good as can be expected at this season. Business through the country is in general prosperous, and a hopeful tone pervades the trade in regard to fall business. Prices are not strong, but there are few changes.

### Cut Nails.

The consumption of Nails is quite heavy, and the leading houses are doing a good business. The curtailment of production referred to last week has been carried still further since then by the forced suspension of operations at factories in Central Pennsylvania which have been flooded by the great rise in the Susquehanna River. Buyers here who have been getting their supply from that section are somewhat anxious and are seeking to cover their immediate requirements from other sources. Advantage has not been taken of this circumstance to raise prices, but it seems altogether likely that if the Central Pennsylvania supply should be cut off for any length of time prices will go up naturally. The Oxford Nail factory is again running but only temporarily, and will shut down as soon as its stock of Plate is consumed and will then await developments. Iron Nails are still quoted at \$1.80 to \$1.90, according to quantity.

### Export Trade.

The condition of the export trade remains about the same as last month; good orders continue to arrive from the Argentine Republic and the last mail from the Australian Colonies was a shade better than those received in April and May. Latest advices from Melbourne state that orders will be held back as much as possible until freight rates are more favorable. At the present time, however, rates are firm, and there seems to be considerable doubt as to the weakness promised. Freighters are in a peculiar situation; vessels they must have, and they are obliged to charge their customers high rates and run the chance of driving away business or reduce rates lower than charter and lose money. At present rates freight is scarce, for Melbourne and Sydney particularly, and heavy shipments of lumber and oil to fill vessels are the results. This means loss to freighters at present state of market in the colonies. Melbourne has 100,000 cases of oil on hand; Sydney, say, 90,000, not taking into account heavy shipments to arrive. The lumber market in Melbourne is reported as fair, while Sydney is dull. A great deal of interest is being taken by the American manufacturers in the export business, and new lines are rapidly being introduced into the Argentine and Australian colonies. The American manufacturer cannot be accused of non-activity or lack of enterprise in seeking foreign markets; he has had remarkable patience and has passed through trials and tribulations without number. In order to get his goods introduced a lot of money has been invested in catalogues, export journals with little or no circulation in markets where his goods could be sold, in contributions to pay expenses of travelers to foreign markets, and in consignments for which no return has ever been made, and in other fruitless ways.

### Wire Nails.

We give below the new Wire Nail card, June 1, 1899, in the form in which it has been adopted by the manufacturers. It will be observed that it covers the Standard Nails and also the Shelf goods. In accordance with the outline of the plan, as referred to in our last issue, it will be observed that the object sought to be accom-

plished by the manufacturers in this new arrangement, which is so important a departure from former methods, is to have a system by which Nails of any regular size or kind may be sold at a single base price. The card has accordingly been so arranged as to cover by its advances the increased cost of the different goods, so that it will apply to any and all goods described in it. Another object in adopting this scheme has been to reduce the assortment of the goods regularly sold under the miscellaneous list, a selection having been made of such gauges as in the judgment of the manufacturers were the most desirable for the trade in general. This is expected to result to the advantage of the manufacturer in diminishing the number of sizes to be manufactured and carried in stock, while the selection made is considered as suitable for the merchant and tending to discourage the carrying of several gauges of Nails of the same kind and length. Nails not described in the card are to be sold at special net prices. The manner in which the card is proportioned to the cost of the goods is intended to remove the temptation to cut on certain goods, the extras on which much exceeded the increase in their cost. It will thus be seen that the extras on some of the leading sizes, which were unreasonably low, have been increased, while on the smaller sizes, which were held at unnecessarily high prices, they have been very materially reduced. The following is the new card:

### WIRE-NAIL CARD.

WIRE NAILS [IN KEGS] JUNE 1, 1899.

60d Common, Base.....

Common Fence, Shingle, Flooring and Common Brads.		Lining Nails.	
60d..... base.		Extras.	
50d..... \$0.10		1 in..... \$3.50	
30d and 40d... .20		1 in..... 3.00	
20d..... .30		1 in..... 2.50	
12d and 16d... .35		Barrel.	
10d..... .40		1 in..... \$8.00	
8d and 9d..... .50		1 in..... 2.50	
6d and 7d..... .65		1 in..... 2.00	
4d and 5d..... .90		1 1/2 in..... 1.75	
3d..... 1.50		1 1/2 in..... 1.50	
2d..... 2.00		1 1/2 in..... 1.25	
Barbed Common and Barbed Car Nails.		1 1/2 in..... .90	
25 cents advance over common.		Slating.	
Casing and Smooth Box.		2d..... \$2.00	
30d and 40d... \$0.60		3d..... 1.25	
20d..... .70		4d..... 1.00	
12d and 16d... .80		5d..... .90	
10d..... .90		Tobacco.	
8d and 9d... 1.00		4d and 5d... \$1.00	
6d and 7d... 1.25		6d and 7d... .75	
4d and 5d... 1.50		8d and 9d... .60	
3d..... 1.75		10d..... .50	
2d..... 2.25		Barbed Roofing.	
Barbed Box, 25 cents advance over smooth.		1 in..... \$8.00	
Smooth Finishing Nails.		1 in..... 2.50	
2d..... \$2.50		1 in..... 2.00	
3d..... 2.00		1 1/2 in..... 1.50	
4d and 5d... 1.75		1 1/2 in..... 1.25	
6d and 7d... 1.50		1 1/2 in..... 1.00	
8d and 9d... 1.25		2 in..... .90	
10d..... 1.00		Clinch Nails.	
12d and 16d... .90		2d..... \$3.00	
20d..... .80		3d..... 2.00	
Barbed Finishing, 25 cents advance over smooth.		4d and 5d... 1.50	
Fine Nails.		6d and 7d... 1.00	
2d..... \$2.50		8d and 9d... .90	
3d..... 2.00		10d..... .75	
4d..... 1.75		12d and 16d... .60	
		20d..... .50	
		Wire Spikes.	
		All sizes..... \$0.50	
		Hinge Nails.	
		4d..... \$1.75	
		6d..... 1.50	
		8d..... 1.25	
		10d..... 1.00	
		12d to 16d... .90	
		20d..... .75	

### SHELF GOODS, WIRE NAILS—PRICES STATED ARE FOR 1-POUND PAPERS.

For Nails in 25 and 50 pound boxes bulk deduct 25 cents per 100 pounds.

For Nails in 100-pound kegs deduct 50 cents per 100 pounds.

For Nails in 1/2-pound packages add \$1 per 100 pounds.

For Nails in 1/4-pound packages add \$2 per 100 pounds.

60d Common, standard..... Base.....

<i>Fine Finishing Nails.</i>	<i>Clout Nails. Oval or Flat Heads. Bright or Annealed.</i>
<i>Gauge. Extras.</i>	<i>Gauge. Extras.</i>
$\frac{3}{8}$ in.. (20).... \$11.50	$\frac{3}{8}$ in.. (19).... \$9.50
$\frac{1}{2}$ in.. (20).... 9.50	$\frac{1}{2}$ in.. (18).... 7.50
$\frac{3}{8}$ in.. (19).... 7.50	$\frac{3}{8}$ in.. (17).... 6.00
$\frac{1}{2}$ in.. (19).... 6.00	$\frac{3}{8}$ in.. (16).... 4.25
$\frac{3}{4}$ in.. (18).... 5.00	$\frac{1}{2}$ in.. (15).... 4.00
1 in.. (18).... 4.50	1 in.. (14).... 3.25
$1\frac{1}{2}$ in.. (17).... 4.00	$1\frac{1}{2}$ in.. (14).... 3.10
$1\frac{1}{2}$ in.. (17).... 3.75	$1\frac{1}{2}$ in.. (13).... 3.00
$1\frac{1}{2}$ in.. (16).... 3.25	$1\frac{1}{2}$ in.. (13).... 3.00
$1\frac{1}{2}$ in.. (15).... 3.25	$1\frac{1}{2}$ in.. (12).... 2.75
2 in.. (14).... 3.00	$1\frac{1}{2}$ in.. (11).... 2.50
$2\frac{1}{2}$ in.. (14).... 3.00	$2\frac{1}{2}$ in.. (10).... 2.25
$2\frac{1}{2}$ in.. (13).... 2.75	
$2\frac{1}{2}$ in.. (12).... 2.75	
3 in.. (12).... 2.50	
<i>Fine Brads.</i>	<i>Bracket and Chair Nails.</i>
$\frac{3}{8}$ in.. (19).... 9.50	$\frac{1}{2}$ in.. (20).... \$9.50
$\frac{1}{2}$ in.. (19).... 8.50	$\frac{3}{8}$ in.. (19).... 7.50
$\frac{3}{8}$ in.. (18).... 6.50	$\frac{1}{2}$ in.. (18).... 5.50
$\frac{1}{2}$ in.. (18).... 5.50	$\frac{3}{4}$ in.. (17).... 4.50
$\frac{3}{4}$ in.. (17).... 4.50	1 in.. (16).... 4.00
1 in.. (17).... 4.00	$1\frac{1}{2}$ in.. (16).... 4.00
$1\frac{1}{2}$ in.. (16).... 3.75	
$1\frac{1}{2}$ in.. (16).... 3.50	
$1\frac{1}{2}$ in.. (15).... 3.00	
$1\frac{1}{2}$ in.. (14).... 3.00	
2 in.. (13).... 2.75	
$2\frac{1}{2}$ in.. (13).... 2.75	
$2\frac{1}{2}$ in.. (12).... 2.50	
$2\frac{1}{2}$ in.. (11).... 2.50	
3 in.. (11).... 2.40	
<i>Trunk Nails. Oval or Flat Heads.</i>	<i>Barbed Caster Nails.</i>
$\frac{3}{8}$ in.. (20).... \$11.50	$\frac{3}{8}$ in.. (18).... \$4.75
$\frac{1}{2}$ in.. (19).... 8.00	$\frac{1}{2}$ in.. (13).... 4.75
$\frac{1}{2}$ in.. (18).... 6.50	1 in.. (13).... 4.50
$\frac{3}{4}$ in.. (18).... 4.50	$1\frac{1}{2}$ in.. (12).... 3.75
$\frac{1}{2}$ in.. (16).... 4.25	
1 in.. (15).... 3.50	
$1\frac{1}{2}$ in.. (15).... 3.25	
$1\frac{1}{2}$ in.. (14).... 3.10	
$1\frac{1}{2}$ in.. (14).... 3.10	
$1\frac{1}{2}$ in.. (14).... 2.85	
$1\frac{1}{2}$ in.. (13).... 2.85	
2 in.. (13).... 2.75	
$2\frac{1}{2}$ in.. (12).... 2.75	
$2\frac{1}{2}$ in.. (11).... 2.50	
<i>Wagon Nails.</i>	<i>Barbed Lock Nails.</i>
$\frac{1}{2}$ in.. (14).... \$7.50	$\frac{1}{2}$ in.. (14).... \$7.50
$\frac{3}{8}$ in.. (13).... 6.50	$\frac{3}{8}$ in.. (13).... 6.50
$\frac{3}{4}$ in.. (13).... 5.50	$\frac{1}{2}$ in.. (12).... 4.75
$\frac{1}{2}$ in.. (12).... 4.75	

All Barbed Nails 25 cents advance over smooth.

All special Nails at special prices.

The objects of the manufacturers in adopting the above card are clearly explained in the following circular, which has been issued by the Cincinnati Wire Company, Cincinnati, Ohio:

The advantage of this list to the dealer over the old method of quoting will be appreciated at a glance. It does away with a great many gauges for which there was little or no sale; it also does away with the miscellaneous list.

It covers all standard stock sizes. Any length or gauge of Nail not on this list will be regarded a special Nail to be made to order at a special net price.

Under this list all Nails of every description in any size package will be quoted on the one base price of 6d common. Each length and gauge of Nail is put under its proper head, so that in ordering it will not be necessary to state any gauge, but simply to state the kind of Nail and length or penny.

Each size in this list is rated according to its relative cost above the base size, and there will therefore be no cutting of classification.

The HP Nail Company, Cleveland, Ohio, send out the new card with this explanatory circular:

At a meeting held in Cleveland, Ohio, May 23, to take into consideration the changing of



the Wire-Nail price list, 90 per cent. of the Wire-Nail capacity of this country was represented, and voted unanimously to adopt the new list, as presented, to go into effect June 1, 1889. Great care has been taken in making this change. The aim of this new price-list is to sell each Nail (as near as possible) on a basis of its cost. The former base Nails have been advanced, and the high advance Nails have been reduced. The miscellaneous list (which was subject to discount) has been abolished. All Nails on this new price-list are sold from the same base price, with advances added. Special Nails not found in this list will be subject to special prices. We feel satisfied that this change will be as satisfactory to the buyer as to the manufacturers. There are no good reasons why you should have any more sizes of Wire Nails to carry than Cut Nails.

As showing the value of Nails under the new as compared with the old card, we have received the following figures, which relate to an actual retail assortment of the standard goods on hand at the time of the change. The base price is put in both cases at \$2.75. It will be seen that there is with this assortment, which is not entirely symmetrical, very little difference in the aggregate value under the new and the old cards:

No. kegs.	Nails.	Old card.	New card.
1	2d fine.....	\$6.25	\$5.25
7	3d fine.....	40.25	33.25
5	2d fine.....	27.50	23.75
2	3d .....	9.50	8.50
13	4d .....	48.75	47.45
6	5d .....	22.50	21.90
45	6d .....	155.25	153.00
4	7d .....	13.80	13.60
66	8d .....	204.60	214.50
5	9d .....	15.50	16.25
27	10d .....	78.30	85.05
3	12d .....	8.25	9.30
3	16d .....	8.25	9.30
5	20d .....	13.75	15.25
2	30d .....	5.50	5.90
2	40d .....	5.50	5.90
2	50d .....	6.20	5.70
2	60d .....	6.20	5.50
200	.....	\$675.85	\$679.85

We are not informed that any action was taken by the manufacturers in regard to the base price, as in the present condition of the market it would not probably be feasible to secure entire agreement upon this point. We understand, however, that the purpose of the manufacturers is that the base price which has for some time been ruling be adhered to.

#### Miscellaneous Prices.

In sympathy with the Copper market the prices of Plumbers' and Steam and Gas Fitters' Brass-Work are slightly lower, and are not characterized by entire uniformity.

Agricultural Wrenches are held firmly at the lately slightly advanced prices, and are quoted regularly at discount 80 per cent.

The Lead manufacturers held a meeting in this city last Friday and made a small advance on Sheet and Pipe Lead, the new quotations being, Sheet, 6½¢, and Pipe, 6¢. The condition of the Lead market was the cause of this change, and it is not unlikely that Shot will soon follow.

The Hazard Powder Company, 97 Randolph street, Chicago, Ill., issue a circular relating to Shot-Gun Cartridges loaded to their order with Hazard Powder, and send also a price-list. A discount of 40 and 10 per cent. is quoted, with extra discounts for quantities named.

In his advertisement on page 118, C. E. Hudson, Leominster, Mass., calls attention to his line of Apple-Parers for the coming season. The name of his Hudson '88 has been changed to the Daisy. The following revised quotations on Apple-Parers, which, it will be observed, are lower than prevailed last year, are made by him:

Little Star, per dozen.....	\$4.25
Rocking Table, per dozen.....	5.50

#### Relief for the Sufferers.

The Hardware Board of Trade, 4 and 6 Warren street, New York, are receiving subscriptions for the relief of the sufferers by the disaster in Johnstown and vicinity. Those reported to the hour of going to press are as follows:

New York Belting and Packing Co.....	\$500.00
Wallace & Sons.....	100.00
Thomas Kenworthy.....	100.00
Wiebusch & Hilger.....	50.00
Schoverling, Daly & Gales.....	50.00
Alfred Field & Co.....	50.00
Henry B. Newhall Co.....	50.00
Maltby, Henley & Co.....	50.00
Hermann Boker & Co.....	50.00
Topping & Fox.....	50.00
F. & W. Clatworthy.....	25.00
McCoy & Sanders.....	25.00
A. B. & W. T. Westervelt.....	10.00
O. Lindemann & Co.....	10.00
Bayles Bros.....	10.00
William Bishop.....	5.00

This list, it is hoped, will be largely increased, but it should be borne in mind that many Hardware houses have contributed to the same object, which makes so strong an appeal to the sympathy and liberality of all, through other channels.

#### Trade Topics.

With reference to the position of Los Angeles, Cal., and the feeling of opposition on the part of its merchants to Pacific Coast agencies with headquarters at San Francisco, a matter to which we alluded in a recent issue, we have the following from a well-known Hardware house of that city, and our correspondents refer also, it will be observed, to Los Angeles as a business center:

The time has been when exclusive agencies were the rule in many lines and located at San Francisco, notably Farm Implements and Tools. We have occasionally, when asking for prices from Eastern manufacturers, been courteously referred to "our exclusive agent" at San Francisco. We have uniformly replied that the markets of San Francisco and Los Angeles are as distinctly two markets as are the markets of Portland, Me., and Charleston, S. C., and that we should pay no percentage to coast exclusive agencies. The real-estate boom having departed from this city and section, we have now settled down to legitimate business. Our city and country can boast of steady advances in population, reasonable activity in building and improving, and the outlook is good. We have a rich country, and we think there can be no question as to the probability of a successful future for our trade.

The fraternity of commercial travelers who are endeavoring to induce the railroad companies to adopt an interchangeable 5000-mile ticket at 2 cents per mile, are hoping that their efforts will be attended with success, especially as they are aided by the co-operation of merchants and manufacturers in some leading cities. The principal difficulty in the way is the apprehension of the railroad companies that the tickets would fall into the hands of scalpers, and thus be diverted from their intended exclusive use by the travelers to whom they are issued. If assurances could be given to the railroad companies that this would not be the case there would be little doubt but the tickets would be promptly and cheerfully furnished.

In reply to the inquiry which appeared in our last issue from an Alabama Hardware man as to the proper place on boxes to mark cost and selling price—front, side or bottom—we have the following succinct and pointed advice from a prominent New England merchant:

Do not mark the cost or selling price on the box. In buying stock select a line and stick to it. Put the boxes the maker puts the goods into on the shelves. Sample nothing unless it is under glass. Buy Root's lists and use them. To say more is to waste your time and space.

Merchants are often annoyed by having business in their town given to outside parties, and where the outsider is in a position to supply the goods or do the work better or on more advantageous terms there

is of course no good reason for complaint, but sometimes the home merchant is compelled to see the contract given to outside parties without any such justification. This matter is referred to by a correspondent in the West, who alludes to it in this way:

I had a conversation with a steam-fitter about keeping trade in his own town. He stated that on public work preference always seemed to be given to outsiders, and mentioned one job on which he was required to give bonds to twice the amount of the job, and to agree to accept a small cash payment on the completion of the work and the balance in six months. The job was awarded to a man from an adjoining city, who received cash on completion of the job at the same figures.

This was probably an exceptional case, as local pride and the public spirit of each town are usually on the side of its own merchants, and we happened to have advice by the same mail in regard to a job in the same vicinity as that referred to, in which the merchant who resided in the adjoining town was informed that unless his figures were very much below those of their local concern the contract would be kept at home, as they desired to avoid sending the money out of town.

#### Items.

A catalogue showing remarkable care and skill in its compilation has just been issued by Horton, Gilmore, McWilliams & Co., Chicago, Ill., and in it there are a number of features which are new and commendable. It opens with a title-page which is reproduced in the advertisement of the house on page 87, after which is a page devoted to what they call "Our Pick-up Department," which contains the mottoes "Quick Delivery," "Complete Shipments," "No Substitution," "Bottom Prices," and gives illustrations to emphasize their readiness to pick up for their customers any outside goods which can be found in the city and their facilities for doing the same, with the suggestive intimation that everything can be found in the Chicago market that is worth having. The volume is given a formal introduction in a letter to the trade in *fac-simile* of the handwriting of James M. Horton, the president. This catalogue derives special interest from the fact that it is the first which has ever been issued by the house, and illustrates the energy and enterprise of its present management. It is a volume of 1190 pages and represents an exceedingly complete line of Hardware and related goods. It opens with Mechanics' Tools and passes on to Agricultural Tools, including Steel Goods, Rakes, Shovels, Post-Hole Diggers, &c. Builders' Hardware, covering a large variety of staple and special goods, next follows, after which the department devoted to Cutlery is reached, which opens with illustrations of the Revolving Show-Cases which are given to customers who purchase the company's goods when a line of Table Cutlery, miscellaneous Knives, Pocket Cutlery, Sheep Shears, &c., is shown. The department devoted to Revolvers, Guns, Ammunition, &c., follows, with the related goods in the way of Fishing-Tackle, Bicycles, Velocipedes, &c. Tin Ware, Pieced, Stamped and Japanned, is represented in suitable variety and with very satisfactory cuts. Many other goods in this department are shown, and also Tinsmiths' Tools, Machines and Supplies, Refrigerators and many miscellaneous articles. Near the end of the volume are such staple goods as Tacks, Nails, Screws, Bolts, Horseshoes, Metals, &c., and it closes with Spectacles, Clocks, an interesting variety of such oxidized silver goods as Shoe-Horns, Bonbonieres, Pins, Match Safes, Vinaigrettes, Book-Marks, Glove-Buttoners, Button-Hooks, Letter-Openers, Paper-Knives, &c. The volume is well printed, conveniently arranged and fully illustrated. It will be sent to cus-

tomers with the first goods ordered, and is not, we are advised, for sale.

L. W. Ferdinand & Co., Boston, Mass., have issued a convenient illustrated catalogue of 180 pages, in which prominent place is given to the manufactures of the Shelton Brass Hardware Company, for whom they are agents. The list thus represents an extensive line of Heavy and Ship Chandlery Hardware, Tackle Blocks, Cordage, &c., and will be found convenient and serviceable as giving a desirable assortment of these goods. Several specialties are illustrated which are of interest.

T. Seloff & Co., Detroit, Mich., successors to McCutcheon & Hanford, dealers in Hardware, Stoves, Hot-Air Furnaces, &c., 57 Grand River avenue, have recently purchased a fine brick building at 787 Grand River avenue, and have about completed its equipment. This firm are, we are advised, the Detroit agents for Sayre, Owens & Co., manufacturers of the Union, Oneida and Tubular Hot-Air Furnaces, Utica, N. Y.

In connection with the formal notice of the disposal of the stock of goods and goodwill of the business of Caruth & Byrnes Hardware Company to the Simmons Hardware Company, St. Louis, Mo., a more personal announcement is made by David W. Caruth, president of the former company. It is in the following graceful and appropriate terms:

MY DEAR FRIENDS: Owing to physical infirmities, increasing with years, I have found it necessary for me to be relieved as far as possible from the cares of active business. This has induced me, and through me the Caruth & Byrnes Hardware Company, of which I am president, to go out of active business. To accomplish this end with satisfaction to ourselves and with due regard to the welfare and interests of our many patrons and friends, we have this day transferred our stock of goods to the Simmons Hardware Company, of St. Louis, which concern has thus become our successors. I personally desire to express to you all my warmest friendship, and at the same time to thank you cordially not only for your liberal patronage, but especially for the very friendly business and personal favors extended to us in the past. I shall be most happy to meet any of you at any time (for I shall remain in St. Louis). Our office will be with Simmons Hardware Company, at which place I shall make my headquarters to adjust and settle up the old business of our company and where I shall be glad to welcome you.

In the description given in our issue May 28 of the Sash Lock and Ventilator manufactured by Jenkins & Timby, Oswego, N. Y., and 102 Chambers street, New York, the cut illustrating it was inadvertently placed upside down, thus rendering less clear and satisfactory the description and perhaps puzzling those who did not give careful attention to it. Our readers will please note the correction, and it may be worth their while to look again at the description, that they may get a clear idea of the construction and merit of the Sash Lock and Ventilator. They will be able to do this very readily by reference to the advertisement in this issue on page 93, in which a very clear illustration of the article is given. The manufacture of this article is attended to by I. G. Jenkins, Oswego, N. Y., while its sale is attended to by T. F. Timby, 102 Chambers street, New York.

James E. Colby, a traveling salesman for the wholesale Hardware firm of Markley, Alling & Co., has disappeared, and the members of the firm apprehend that he has been foully dealt with. His territory was through Iowa. When last heard of he was at Neola, May 11. His employers have made liberal use of the telegraph wires, but nothing can be learned of him. He is not known to have had any enemies, and is well liked by the men on the road. Mr. Colby is about 27 years old and wears a heavy dark mustache. He is a native of Toronto, Ont. Members

of the firm think he engaged a team to drive to a point in the country and was "held up" by highwaymen. While out of Chicago Mr. Colby made Des Moines his headquarters.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., issue a price-list of Fire-Works, in which many illustrations are given showing the display secured by the different articles, and thus of special interest as including many novelties, as well as staple Fire-Works. A number of assortments of Fire-Works, in cases, are also given, with the value of the goods at retail prices and their list-price, which is subject to discount. A number of Pistols and related goods are also included in the catalogue.

E. C. Meacham Arms Company, St. Louis, Mo., issued under date May 24 another of their price-currents representing their unusually complete assortment of Arms, Ammunition, &c. Their discount sheet is attached.

Morley Bros., East Saginaw, Mich., issue a circular calling attention to the Letter Opener, of which we recently gave a description, and which they are putting on the market. The advantages of this device and the manner in which it does its work are alluded to.

The Niagara Stamping and Tool Company, Buffalo, N. Y., issue a large sheet illustrating a varied line of goods in which supplies for canning factories are given a prominent place, and the completeness of their assortment of these goods is emphasized. It will be of interest to many in the trade as relating to Machines and articles which are not often found in catalogues.

Wells Bros. & Co., Greenfield, Mass., issue a neat catalogue devoted exclusively to Stratton Bros' Improved Spirit Levels, of which they are now the sole manufacturers.

J. H. Martin & Co., 143 Water street, St. Johns, N. F., issue a sporting catalogue relating to Fishing Tackle, Cricket Goods, Guns, Ammunition, &c., in which an interesting assortment of goods in these lines is represented, with prices. They also call attention to the fact that their principal business is Shelf and Heavy Hardware and general House-Furnishing Goods, full lines of which are kept in stock.

James E. Halsey, who is widely known to Hardware men from his long connection with the trade, especially in the South, will represent the Electric Cutlery Company, 91 Chambers street, New York, in the Southern States, selling their Electric Razors and Cutlery, Lamont and Electric Razor-Strops, &c.

Butts & Ordway, 145 Pearl street, Boston, Mass., announce that they have added to their stock a line of Builders' Hardware, and allude to the favorable terms on which they are offering the goods.

#### Exports.

PER BARK HARRIET S. JACKSON, MAY 18, 1889, FOR EAST LONDON, SOUTH AFRICA.

By W. H. Crossman & Bro.—6 dozen Hatchets, 20 crates Stoves, 8 cases Carriage Hardware, 68 packages Carriage-Ware, 300 dozen Hatchets, 5 dozen Hatchets, 5 dozen Axes, 120 dozen Brooms, 3 dozen Churns, 3 dozen Clocks, 15 dozen Traps, 50 dozen Handles, 7000 pounds Nails, 10 Lawn Sprinklers, 94 packages Stoves, 18 Scales, 5750 pounds Sash Weights, 155 pounds Sash Cord, 6 dozen Hatchets, 30 dozen Brooms, 1820 pounds Sash Weights, 2 dozen Sash Cord, 5 dozen Wash-Boards, 3 dozen Tables, 10 dozen Traps, 1 dozen Clocks, 52 cases Stoves, 504 Flows, 608 Flows.

By Coombs, Crosby & Eddy.—7 Plows.

PER BARK G. M. STANWOOD, MAY 20, 1889, FOR FREEMANTLE, AUSTRALIA.

By Winchester Repeating Arms Co.—36 Guns, 30,000 Metallic Cartridges.  
By Mailler & Quereau.—1 case Guns.

y R. W. Forbes & Son.—8 packages Hardware, 174 dozen Axe and Pick Handles, 1 gross Blacking, 600 pounds Axle Grease, 2 gross Shade Rollers, 2 dozen Store Trucks, 24 sets Axes, 1 case Horse Hoes, 3 cases Churns, 12 boxes Scales, 35 dozen Axes, 6 dozen Axes, 8 dozen Fork Handles.

By Arkell & Douglas.—54 cases Edge Tools, 16 cases Edge Tools, 12 cases Handles, 36 dozen Shade Rollers, 6 dozen Traps, 1 dozen Wringers, 8 cases Axle Grease, 6 cases Spokes, 17 bundles Fellos, 14 bundles Wash-Boards, 3 cases Axes, 12 boxes Clothes-Pins, 4 crates Rolling-Pins, 22 cases Hardware, 9 cases Edge Tools, 7 cases Handles, 4 racks Churns, 12 dozen Wash-Boards, 1 case Brooms, 2 cases Perambulators, 14 cases Meat-Cutters, 2 cases Toys, 15 cases Hardware, 18 cases Edge Tools, 12 dozen Forks, 6 boxes Clocks, 4 cases Hardware.

By H. W. Peabody & Co.—9 cases Hardware, 3 dozen Wash-Boards, 12 cases Hardware, 4 packages Dairy Implements, 2 gross Brooms, 11 cases Edge Tools, 20 dozen Brooms, 23 cases Hardware, 11 cases Fire-Arms, 24 dozen Wash-Boards, 1 case Toys, 24 dozen Shade Rollers, 1 case Pumps, 2 dozen Churns, 192 dozen Handles, 6 cases Axes, 33 packages Carriage-Ware, 1 case Agricultural Implements, 1 case Scales, 1 case Carriages, 32 packages Hardware, 1 case Skates, 1 case Dairy Implements, 2 packages Whips, 7 packages Agricultural Implements, 2 cases Harness, 190 dozen Blacking, 3 Refrigerators, 8 cases Fire-Arms, 5 cases Clocks, 409 pounds Bolts, 300 pounds Fuse, 50 feet Hose, 1 case Blocks, 3 cases Bolts, 11 cases Hardware, 1000 Handles, 6 cases Fire-Arms, 2 cases Wringers, 2 cases Clocks, 2 cases Perambulators, 1 case Wringers, 1 case Pumps, 9 cases Hardware, 4 cases Fire-Arms, 24 dozen Handles, 3 dozen Churns, 1 case Freezers, 6750 pounds Twine, 1 case Emery Goods, 36 dozen Handles.

PER BARK MATHEW BAIRD, MAY 24, 1889, FOR PORT NATAL, SOUTH AFRICA.

By R. W. Forbes & Son.—7 cases School Slates, 22 packages Scrapers.

By H. W. Peabody & Co.—100 dozen Handles and Brooms, 1 case Stamped-Ware, 8 cases Hardware, 79 packages Agricultural Implements, 12 dozen Wash-Boards.

By Corner Bros. & Co.—110 dozen Tools, 80 cases Hardware.

By W. H. Crossman & Bro.—120 dozen Brooms, 20 dozen Wash-Boards, 5 dozen Axes, 60 dozen Pick-Axes, 16 dozen Axes, 192 dozen Handles, 1 case Hardware, 15 dozen Curry-Combs, 1/2 dozen Churns, 1 dozen Shellers, 1 dozen Store Trucks, 3 Refrigerators.

PER BRIG NETTIE, MAY 24, 1889, FOR AUCKLAND, NEW ZEALAND.

By Arkell & Douglas.—2 crates Handles, 2 cases Hardware, 1 case Saws, 1/2 dozen Mangles, 2 cases Nails, 1 case Wringers, 11,200 pounds Barb Wire, 5 cases Edge Tools, 3 dozen Ox Bows, 170 pounds Bolts and Nuts, 60 boxes Horse Nails, 2 cases Hammers, 28 cases Handles, 4 dozen Springs, 6 cases Hardware, 10 dozen Handles, 3 cases Edge Tools, 3 cases Saws, 2 cases Hammers, 2 cases Wringers, 8 cases Traps, 500 Broom Handles, 6 dozen Rakes, 1 1/2 dozen Churns, 2 cases Bench Screws, 3 cases Shade Rollers, 1 case Nails.

By H. W. Peabody & Co.—10 cases Hardware 5 cases Agricultural Implements, 14 packages Hardware, 13 cases Stone, 400 feet Belting, 13 packages Churns, 4 cases Fire-Arms, 1 case Castings, 52 packages Hardware, 2 cases Castings, 3 cases Pumps, 170 dozen Handles, 16 packages Agricultural Implements, 20 packages Lawn Mowers, 21 packages Churns, 1000 feet Rubber Hose, 950 pounds Nails, 3 crates Sewing-Machines, 1 package Indicators, 5 tons Barb Wire, 20 packages Agricultural Machinery, 1 case Hardware.

By F. B. Wheeler & Co.—3 1/2 dozen Wringers, 18 dozen Axes, 6 gross Axle Grease, 6 dozen Axes, 1 dozen Axes, 24 dozen Handles, 1/2 gross Axle Grease, 2 dozen Axes, 24 dozen Handles, 1 case Clocks.

By A. S. Lascelles & Co.—2240 pounds Barb Wire, 1 box Wagons, 4 boxes Lawn Mowers, 10 dozen Rakes, 4 crates Wagons, 1 box Cutlery, 1 crate Churns, 2 cases Plated-Ware, 1 dozen Oil Cans, 1 1/2 gross Clocks.

By Welsh & Lea.—12 cases Handles, 5 cases Iron Bolts, 1 case Carpet Sweepers, 3 cases Saws, 9 cases Hardware.

By Morris, Strouse & Co.—20 1/2 gross Fruit Jars.

By Geo. W. Silcox.—25 packages Sewing-Machines.

By H. B. Moore.—400 pounds Refrigerators.

By R. W. Forbes & Son.—36 dozen Axes.

By Mailler & Quereau.—14 packages Reapers, 3 packages Cultivators, 10 cases Scales, 29 cases Handles, 2850 pounds Axes, 60 kegs Nails, 4 cases Wheels.

By Coombs, Crosby & Eddy.—6 Pumps, 78 dozen Wood Handles, 4 dozen Bench Screws, 2 dozen Wringers, 9 Pumps, 6 dozen Rakes, 6 Lawn Mowers, 5½ dozen Tin-Ware, 22 dozen Axes, 4 dozen Grindstone Fixtures, 123 dozen Hardware, 17 Tools, 8 dozen Hammers, 4 dozen Bird-Cages, 11 Meat Choppers, 96 dozen Tacks, 2 dozen Axes, 6¼ gross House-Furnishing Goods, 1 dozen Hay Knives, 1 gross Whetstones, 2 dozen Wrenches, 2½ dozen Churns.

By R. W. Forbes & Son.—45 packages Blacking, 44 packages Sewing-Machines, 69 packages Blacking, 12 boxes Hardware, 2 packages Hardware, 1 box Plated-Ware, 1 case Plated-Ware, 1 case Lamp-Ware, 10 packages Churns, 36 packages Fruit-Jars, 2 cases Hardware, 1 gross Fly-Traps, 30 dozen Rakes, 20 dozen Snaths, 18 dozen Wrenches, 2 dozen Washers, 1 case Grinding Mills, 1 case Shade Fixtures, 1 case Rubber Goods, 17 packages Hardware, 5 packages Planters, 13 packages Agricultural Implements, 20 boxes Lawn Mowers, 30 dozen Spade-Handles, 4 cases Wringers, 100 dozen Axe-Handles.

By W. H. Crossman & Bro.—36 dozen Axes, 11,200 pounds Barb Wire, 37 gross Fruit-Jars, 6 dozen Hatchets, 50 Toy Pistols, 5 packages Plated-Ware, 25 cases Skates, 32 gross Fruit-Jars, 2 dozen Wringers, 30 dozen Wash-Boards, 30 boxes Clothes-Pins, 1 case Ox-Bows, 600 feet Rubber, 1 case Lamp Goods, 1200 pounds Horse-Nails, ¼ dozen Hay-Knives, 3 cases and 46 bundles Carriage-Ware, ½ dozen Lawn Mowers, 3 dozen Axes, 8 dozen Hatchets, 10 dozen Axes, 2 dozen Dashers, 3 dozen Traps, 1 dozen Wringers, 12 dozen Egg-Beaters, 2 cases Hardware, 3 cases Hardware.

#### FOR NELSON.

By Arkell & Douglas.—3600 Cartridges.

By H. W. Peabody & Co.—44,800 pounds Barb Wire, 240 dozen Handles.

By R. W. Forbes & Son.—8 packages Hardware, 2 packages Hardware, 2 crates Butter-Workers, 60,000 Caps, 1 case Miter Boxes, 1 box Pumps, 9 packages Stoves, 1 package Rubber Springs, 9 Emery Wheels, 1 case Lampware, 2 gross Shade-Rollers, 11,250 pounds Barb-Wire, 180 dozen Axe-Handles, 40 dozen Wash-Boards.

By McLean Bros. & Rigg.—500 Handles, ¼ dozen Augers, 1 gross Axle-Grease, 8 dozen Axes, 1 gross Shade-Rollers, 8 gross Lead-Pencils, 1 dozen Bird-Cages, 1 dozen Wringers, 10 dozen Wringers, 4 gross Cotton Lines, 3 dozen Mallets, 2 dozen Cast-Iron Sinks, 4 dozen Lanterns, 1 dozen Dashers, 1½ dozen Churns, 336 pounds Tacks, 9000 Cartridges, 12 dozen Handles, 1 case Castings, 9 gross Fruit-Jars, 2 Drills, 3 cases Assorted Hardware, 12 dozen Wash-Boards, 3 dozen Mop-Sticks, 4 packages Lamp Goods, 8 Lawn-Mowers, 1 case Hardware, 3 cases Hardware, 6 dozen Mattocks, 3 cases Hardware, 12 cases Hardware, 10 Butter-Workers, 48 dozen Handles, 6 dozen Wash-Boards, 22 Stoves, 12 gross Clothes-Pins, 3 packages Stove Fittings.

PER BARK OLE SMITH PLONG, MAY 25, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—24 Plows, 24 pounds Sash-Cord, 6 Plows, 36 Plowshares, 34 dozen Edge Tools, 1152 pounds Sash-Weights, 20 dozen Axes, 40 dozen Hatchets, 3 cases Plows, 60 Ladders, 2 cases Carriages, 9 Carriages, 3 cases Harness, 4 cases House-Furnishing Goods, 40 dozen Edge Tools, 5 cases Bird-Cages.

By Corner Bros. & Co.—97 cases Hardware.

By R. W. Forbes & Son.—6 dozen Axes, 40 dozen Pick-Handles.

By H. W. Peabody & Co.—16,000 pounds Nails, 6 bundles Carriage-Ware, 3 cases Hardware, 2 cases Pumps, 204 dozen Handles, 10 kegs Nails.

By J. Norton & Sons.—11 packages Power Threshers.

#### Outside Lines.

From advices received it is evident that the Hardware business in England is in an unsettled condition and unsatisfactory in some respects, especially as regards the encroachment by merchants in other lines upon Hardware territory. Complaints are frequently made that the business of regular iron-mongers is seriously interfered with by the co-operative stores, dry goods merchants and others, and the question is coming up as to what shall be done to correct this condition of things. The *Ironmonger*, of London, is agitating the question, and under the head of "Opportunities of the Trade" refers to the matter in this way, asking, it will be observed, a free expression of opinion on the subject:

It is held in many quarters that there are excellent opportunities for iron-mongers to embark in other industries, which they could

carry on as aids to and feeders of their iron-mongery branches. It is urged, indeed, that as the drapers have invaded the domain of the iron-mongers and as the "general dealers" also cut several classes of iron-mongery, therefore iron-mongers ought to "go in" for other branches. Some of the new departures suggested are:

Jewelry,  
Fancy Goods,  
Furniture,  
Cycles,  
Basket-Ware,  
Sewing-Machines,  
Clocks and Bronzes,  
Oils and Colors, &c.,  
Drapery,

Guns, Pistols, Rifles, &c.  
Paper-Hanging and Decorating,  
Engineering Work,  
Grocery,  
Gas and Water Fittings,  
Glass and China,  
Stationery and Books,

and so on. Some of these branches, we are well aware, are already carried on by many iron-mongers. Cycles, Oils and Colors, Guns, Rifles, &c., Plumbing and Gas-fitting, and a certain amount of engineering work already find places in the establishments of some iron-mongers; but the other trades indicated above, with many more which might be named, are generally considered to be "out of the way" of iron-mongers. There may or may not be good reasons why they should remain untouched by the trade, and in order to elicit the views of our readers we invite them to discuss the matter fully in our columns. They may say what they like in their letters, but it will serve to direct the correspondence into useful channels if we formulate the following series of questions:

1. What is the most profitable "outside" branch of trade in which an iron-monger can engage?

2. What experience, if any, have you yourself had of carrying on any branch of business other than iron-mongery proper? Answer this question as fully as possible if you are in a position to answer it at all.

3. State your arguments clearly for and against an iron-monger embarking in any branch outside his own trade.

4. If an iron-monger does start an outside branch, what, in your opinion, are the leading principles by which he should be guided?

It is hoped that this discussion may be interesting and profitable to the trade at large. There is certainly plenty of good material for it in existence.

There is, fortunately, in this country a much better condition of things prevailing, and Hardware merchants are permitted to carry on their business with much less interference from outside lines. There is, however, to be observed a certain tendency toward the breaking down of the lines which have separated the different kinds of trade, and there is some reason to apprehend that there will be in the struggle for business an increasing disposition to do this.

#### Arrangement of Stores.

From P. C. Benn, with Willis D. Thompson, Concord, N. H., we have a description of the Belting case shown in the illustration, Fig. 346. It is divided, as indicated, into compartments for the reception of the different sizes of Belting, the compartments being ½ to 1 inch larger than the width of the Belting for which

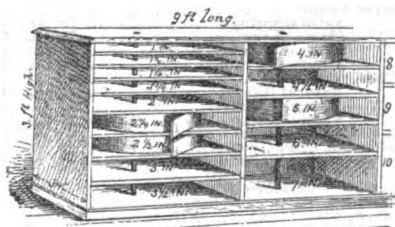


Fig. 346.—Belting Case.

they are designed, a feature which permits the easy insertion of the rolls. Iron rods are run through the middle of these sections of the case for the purpose of holding the rolls of Belting in the places provided for them while any required length is being cut off. It will thus be seen that by simply drawing out the rod any roll can be put in or withdrawn without disturbing the other sizes. The top of the case can be utilized as a counter. Mr. Benn remarks that this case has been in use for the past 15 years, alluding to it as placed

at the rear end of the store, the floor being marked off every 5 or 10 feet to facilitate measuring. The utility of this arrangement will be recognized by the trade.

This rack, Fig. 847, is in use by Hibbard, Spencer, Bartlett & Co., of Chicago, for the purpose of displaying samples of Stove Boards in their house-furnishing department. It is constructed mainly of 2½-inch strips, 1 inch thick, and is put together with screws, so that it can be

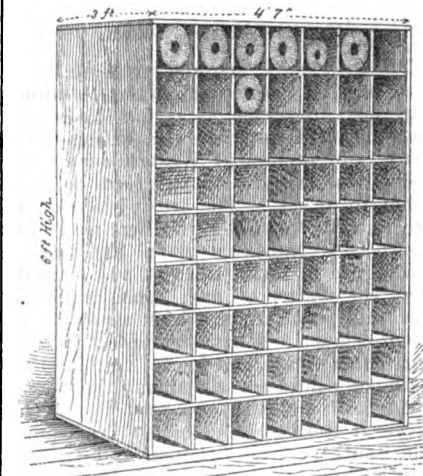


Fig. 847.—Wire-Cloth Rack.

taken down at the close of the season and packed away in small space. The Stove Boards stand on a ledge on the bottom and central strips, there being room for two tiers on each side of the rack. The cross pieces are close enough together to hold the smallest sizes of Boards as well as the large ones.

The accompanying illustration, Fig. 848, is a representation of a new and compact Wire-Cloth rack in use in the Chicago sales-room of the Gilbert & Bennett Mfg.

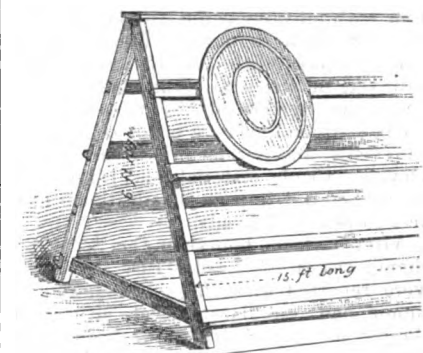


Fig. 848.—Stove-Board Rack.

Company, 148 Lake street. It is intended to hold 63 rolls, embracing a full assortment of widths and colors, up to 3 feet. It stands on the floor and extends to the height of 6 feet 1 inch. It is constructed of white pine, the horizontal pieces being inch boards and the uprights ¾-inch boards. The pigeon-holes are 7 inches square in the clear, which has been found to be about the right size to accommodate Wire Cloth. Above each roll is painted the width and color, as, for instance, "24, drab." A salesman is thus able to lay his hand at once on a desired roll, without pulling a number of them out to see which is the right one. The rack is open front and back, so that it can be used from either point of approach.

The Samoan difficulties are believed to have been definitely settled. The protocol drawn up by the conference at Berlin will be signed next Saturday.





**Non-Friction Band-Saw Guide.**

The three accompanying engravings show clearly the construction and application of a non-friction band-saw guide manufactured solely by Cross & Speirs, of Waterbury, Conn. The guide consists of a holder, in the top portion of which is fitted a sleeve, adjustable to and from the saw and held by a set-screw, and in which turns the shank of the wheel which forms a bearing for the back edge of the saw. In setting the guide, the back of the saw is made to bear a little harder on the upper edge of the disk, leaving a slight opening on the lower edge. The pressure of the work against the saw then makes its back bear securely against the disk. As the movement of the saw revolves the disk or

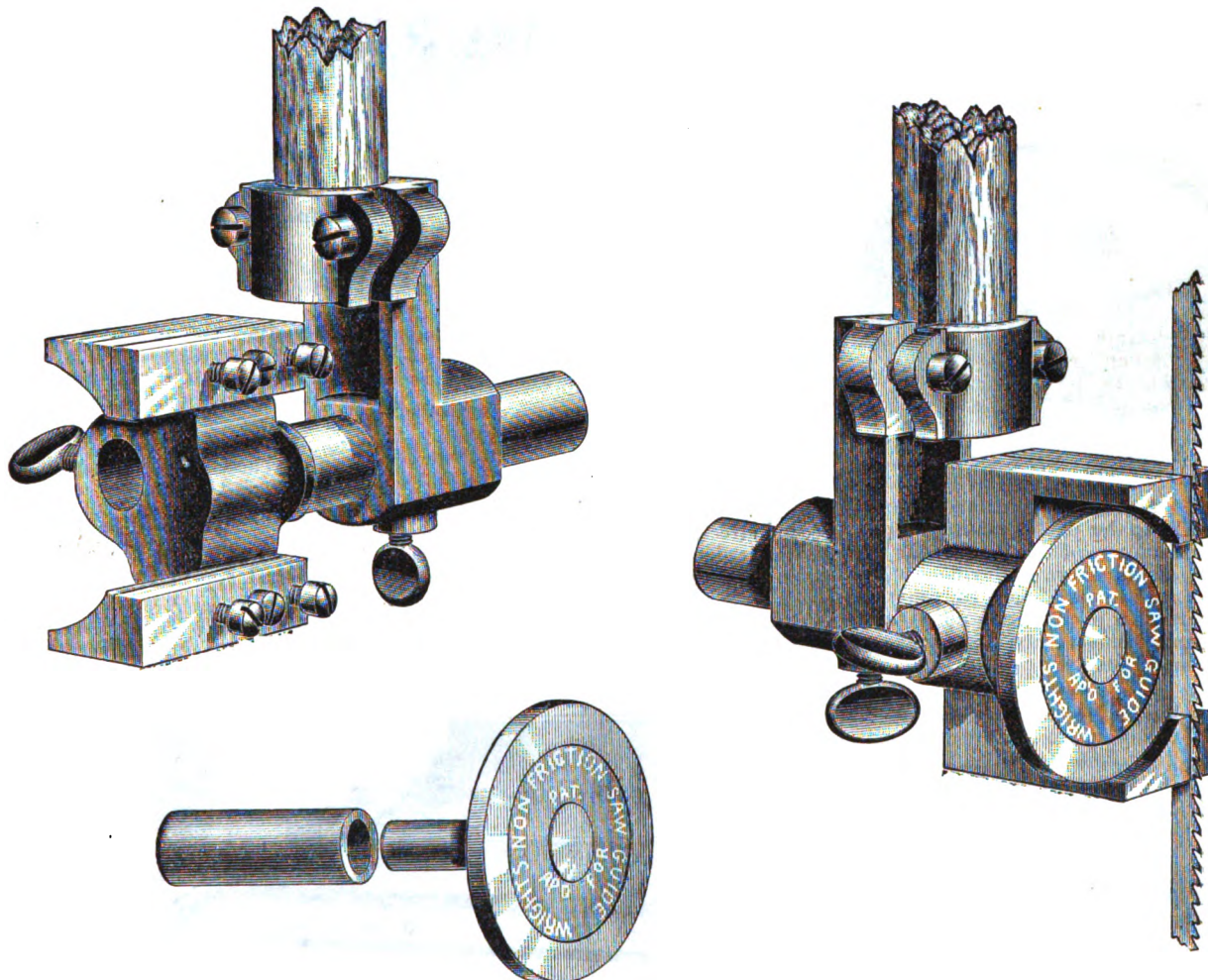
frivolous pretext. St. Nicholas Mole, which rumor says France seeks to acquire by treaty, is capable of being strongly defended and commands the channel between Hayti and Cuba. Most of the commerce of the Caribbean Sea from the United States goes through Crooked Island passage and past Nicholas Mole. As a naval depot the situation is fine.

**A Hardware Drummer.**

Not long ago a drummer for a hardware house started out. He was a giant in strength. He had two strong grips or hand-bags made, and in each he put up iron samples weighing about 185 pounds. He would alight from a train with his two

fellow would take hold of them with a smile and a firm grip, only to go down on the platform in defeat with a thump. Then he would rise, look at the grip, gaze at Smith awhile, then leave, muttering something about voodooism. Smith would then throw them into a wagon and go up to a hotel.

At the door he would call a bell-boy, and as he pushed his way through the crowd he would hand them to the poor, overworked boy, and the crowd would be astonished to see him go down with those grips, the fall making a noise that sounded like a freight-train wreck and shook the house. Smith would pick them up himself, and remark to the landlord that it was a shame to overwork his help in any such manner, and he would then walk



*Wright's Non-Friction Band-Saw Guide.*

wheel friction is done away with, and there is practically no wear at all. The wearing parts of the guide are made from hardened tool steel, and if kept properly oiled will last as long as the saw. The parts are so arranged that they can be adjusted easily to any width or thickness of saw, while the guide can be readily attached without injury to the machine. For resawing or heavy work it is preferable to have two guides, one above and one below the table, but for ordinary work one upper guide is sufficient, as it is so set as to take all the pressure. Testimonials received by the manufacturers indicate that the use of these guides has resulted in a great saving in saws, as the temper is preserved and the back edge is prevented from checking.

There are two much-coveted West India harbors, the Bay of Samana, in San Domingo, and St. Nicholas Mole, at Gonaves, in Hayti. The former at one time was ceded to an American company, but the so-called concession was revoked on a

innocent-looking grips, and the hotel porter would make a rush for him.

"Right this way for the Hardcase House. Carry the grips up to the hotel, boss?"

"Yes," Smith would say—his name was Smith. He would then hand the two grips to that porter, and let go as soon as he saw the unsuspecting victim had hold of them. There would be a wild flourish of feet, a loud crash, and the porter would go down as if he had been shot.

"What are you throwing my grips around in that manner for?" Smith would yell, as if mad.

The porter would jump up, thinking he had stumbled, apologize, and make a grab at the grips. Then he would pull away until his suspender-straps would break, and would say: "B-b-boss, what are these things? I can't lift 'em."

Smith would take hold of them lightly, gently lift them up and say: "Oh, well, if you don't want to carry them I'll go to the other hotel."

Then, calling the other porter, he would give them to him. Of course, the other

toward the register, and the landlord would then rush up to him and say:

"Why, them boys are lazy. Here, give me your grips, sir," and he would take them.

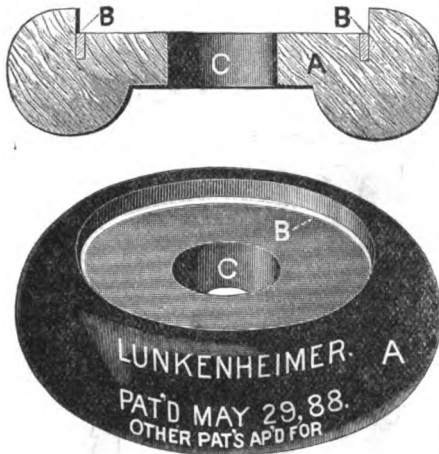
Of course Smith's remarks attracted all eyes, and as the landlord got a good hold of the handles Smith would let go suddenly. The spectators would be astonished to see the landlord's back suddenly hump itself like a cat on a back fence, his eyes bulge out like marbles on a mud wall, and then see him fall full length between those grips with a crash that brought people out across the way. He would get up slowly, rub his back, walk around the grips, and then go and swear, as Smith would take them up and put them on the counter.

Then the fun would begin. The clerk grabbed one of them to set it off the counter and it wouldn't move. He looked astonished, and then spit on his hands and tried to lift it, as his face turned red and knots swelled upon his forehead. But that grip wouldn't move. Then all the crowd would try their hand, and finally

all swear it was some trick. Smith would lift it off gently and ask them what ailed them. This would make the crowd feel his arms, and they found out he had muscles like rocks for hardness. Then it dawned on them that Smith had heavy grips for a sell, and they were correct.

#### An Unbreakable Wood Handle.

The annexed cuts show very clearly the construction of the Lunkenheimer wood handle, which is claimed to be unbreakable. The handle is bound by a seamless brass ring, B, about  $\frac{1}{4}$  inch wide, imbedded in the under side of the handle and there held and concealed by the lower plate of

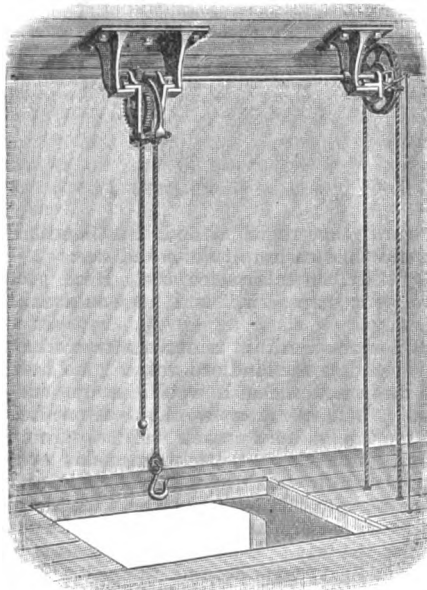


Lunkenheimer Wood Handle.

the handle, thus making it impossible for the handle to be pulled apart or split. The manufacturers of this handle, the advantages of which are self-evident, have prepared special machinery in order to turn it out in large quantities. It is made by the Lunkenheimer Brass Mfg. Company, of Cincinnati, Ohio.

#### Hatchway Hoisting-Machine.

We show herewith a simple and cheap hoisting-machine made in two sizes of 500 and 1000 pounds capacity by the Energy



Hatchway Hoisting-Machine.

Mfg. Company, of 1115 South Fifteenth street, Philadelphia. The hand-rope wheel-shaft is made any length, so that the hand rope is at one side of the hatchway, which is left clear for the load. This hoist is fitted with a double-acting brake, one sus-

taining the load at any point when hoisting, the other being used when lowering to control the speed. The load-rope does not wind around a drum, so the machine can be made much lighter than the old rope-wheel and drum; at the same time it

#### Anti-Friction Elevator-Door Hanger.

The construction of this door-hanger is extremely simple. It consists practically of but two parts, a frame, by means of which it is attached to the door, and a



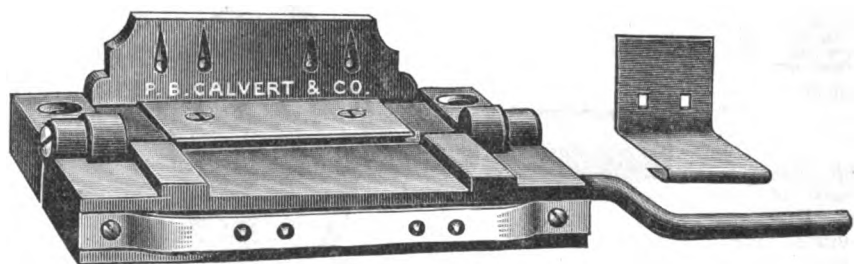
Anti-Friction Elevator-Door Hanger.

does the work with greater ease and rapidity. The manufacturers of this hoist state that they have a great number in use doing all kinds of work.

#### Enright's Cleat Former.

P. B. Calvert & Co., of 68 North Second street, Philadelphia, Pa., are offering the trade a convenient machine known as Enright's cleat former, a general view of which is afforded by the accompanying illustration. This machine is made of cast-iron, and weighs only about 5 pounds. It is so constructed that two cleats may

be formed at one operation, two holes being punched in each cleat, or one cleat may be formed without holes. A steel spring on the front of the leaf releases the cleat after it has been punched. At the right of the cut is shown a cleat already formed, the size being  $1\frac{1}{4}$  inches. A careful inspection of the engraving which we present will enable those in the trade to readily understand the operation of this device.



Enright's Cleat Former, Built by P. B. Calvert & Co., Philadelphia.

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The Warwick Iron Company's furnace, at Pottstown, Pa., was blown out on the 28th ult. for a period of four or five months for repairs. This furnace has been in constant operation since December 15, 1885, with an output of 108,000 tons of iron. Some new improvements will also be added to the works.

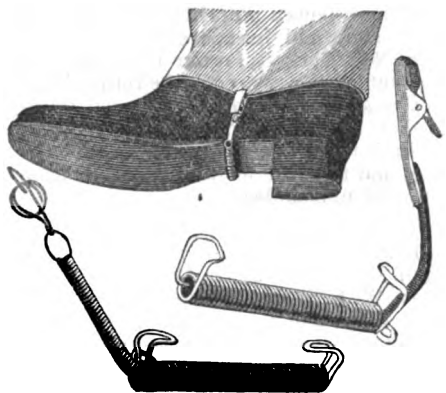
The Treasury Department has decided that certain imported barbed wire to which patent of domestic manufacture has been applied is not entitled to drawback under the law upon exportation.

That part of the apparatus which meets the eye is a sound-receiver made up of two narrow compartments, which are separated from each other by a partition. The receiver is capable of being rotated by the listener, who sits below, and the sounds reach his ear through separate tubes, each connected with one of the compartments. It is only when the receiver is pointed directly at the source of sound that the vibrations enter both ears. If an obstacle lies in the course of a vessel there is a reflex wave of sound obtained by echo.

The indifferent success of an English locomotive recently on trial in this country will be followed by a trial in England of a locomotive built in the United States. It is stated that the Pennsylvania Railroad has decided to send one of its best engines, perhaps "Long-legged No. 10." It will make its first appearance on the London and Northwestern Railroad. As the English railroads are much straighter than those in this country, railroad men are much interested to see what an American locomotive can do on a bee-line track.

**For Horseback-Riders and Bicyclists.**

This device, which is put on the market by Wendell M. Smith, Rochester, N. Y., and George T. Carter, Pittsburgh, Pa., is intended, as shown in the accompanying illustration, to hold the trousers down when riding a horse or bicycle, and is referred to as having advantages over the

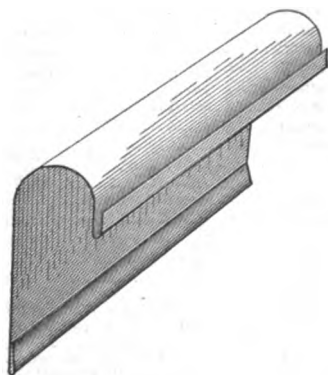


*For Horseback-Riders and Bicyclists.*

old method of straps and buckles, especially in the fact that it is complete in itself and can be attached or detached in an instant. As shown in the cut, the outside is made of wire coiled as in a spring with the ends bent into the form of hooks, so as to clasp the sole of the shoe firmly. A small leather band with a common metal clip on one end passes through the inside of the wire coil and is made fast to its outer end. For bicycle-riders the outside coil is exactly the same, but instead of the little leather strap a fine coil-spring is used, as shown also in the illustration. This is referred to as allowing the trousers legs to give when pedaling, and also prevents them from flapping against the wheels. As the metal clip is also likely to interfere with the wheel, attachment is made on the inside of the trousers leg by means of the spiral hook shown in the cut. When in use the device is concealed from the view of passers-by, does not change the ordinary appearance of the trousers, and when not in use can be carried in one's pocket. It is referred to as simple, durable, inexpensive and as having been thoroughly tested.

**Former for Dipper Handles.**

While factory-made dipper handles may be used to a certain extent, there are many shops where such articles are formed on



*Former for Dipper Handle.—Fig. 1.  
General View.*

the candle mold stake as of yore. The usual method of forming handles is by making bends near the edges by placing the tin on the stake and bending over by

means of the hand, then finishing the edge with the mallet. If a person had a hand whose width was equal to the length of a dipper handle this operation could be very quickly performed, but as the tin-

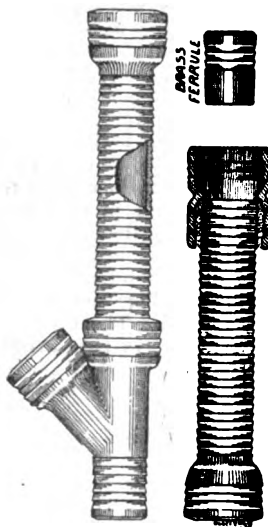


*Fig. 2.—Shape of Handle After Coming from Former.*

ner's hands are not the required width two or more movements are necessary to turn over each edge. A former as shown in Fig. 1 can be made from Russia iron that is very convenient for making the first bend when forming tubes similar to dipper handles. By holding the former in the left hand and slipping the edges of two or more handles in the bend A, then forming, and by treating the other edges in a similar manner, the handles are formed as shown in Fig. 2. The edges are then finished by means of the mallet, and the forming completed in the usual manner.

**A New Kind of Soil-Pipe.**

The Sanitary Soil Pipe Company, 100 West Sixth street, St. Paul, Minn., manufacture and sell Gleich Krause Company's patent soil-pipe, which is illustrated in the cut herewith presented. The main peculiarity of this pipe is the ribbed or serrated exterior surface, the principal advantages of which are that it permits a very tight joint to be made with the hub, and also allows the pipe to be broken readily at any point when in a stack or hanging in



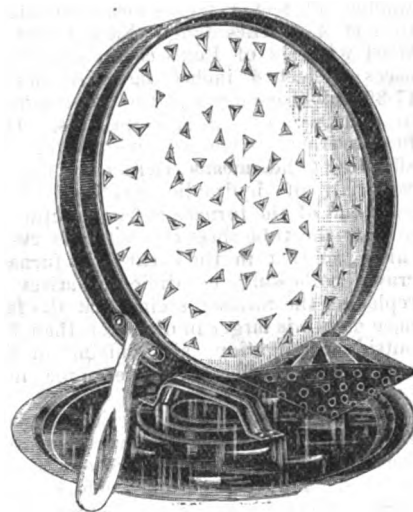
*A New Kind of Soil-Pipe.*

the air. The sectional view through the hub shows the joint to be triple-wedge shaped, as the manufacturers describe it, and forming, they claim, a perfect protection against leaking, expansion, contraction or settling. As noted above, the principal advantage of the form, however, is to prevent splitting or cracking when the pipe is cut, the grooves being spaced  $\frac{1}{4}$  inch. The pipe is said to have an attractive outside appearance, so that it is not necessary to cover it. What is of special interest at a time when particular attention is being given to the testing of soil-pipes is the statement of the manufacturers that this pipe has been repeatedly tested 500 pounds hydraulic pressure without any leak whatsoever. It is also pointed out that considerable saving of material is effected, because the pipe can be cut without splitting or breaking.

The brass ferrule shown in the illustration is for connecting lead waste and vent pipes with the soil-pipe. The manufacturers also allude to their trap covers, which are so constructed as to make a perfect air-tight joint.

**Broilers for Gasoline Stoves.**

Harkins & Willis, of Ann Arbor, Mich., have placed upon the market what they are pleased to term Jim's Meat Broiler, designed for use in connection with gas or gasoline stoves. It is of simple construction and is designed to perform its work without drip or smoke and to require very little attention while in use. From an inspection of the cut presented here-



*Broiler for Gasoline Stoves.*

with it will be seen that the broiler consists of a metal surface perforated with holes, which are so punched as to keep the meat up from the iron plate. The holes are three-cornered, and the flange or burr on each side of the hole tends to keep the meat partially suspended while the heat circulates beneath and closes the pores. This action tends to retain the flavor and juices of the meat, while the peculiar formation of the apertures in the iron plate prevents all dripping. The center is slightly raised, causing the juices to run into the groove or swedge around the edge of the broiler. The arrangement is such that the manufacturers claim there is comparatively little smoke in operation, and that after broiling has been done the device is easily cleaned. It is claimed to be very rapid in operation and to give very satisfactory results.

E. L. Baker, United States Consul at Buenos Ayres, in a report to the Department of State, says that the cattle industry of the Argentine Republic is in such a languishing condition that a law has been passed offering a guarantee of 5 per cent. for ten years on the capital employed in the business of exporting fresh or preserved beef. The report says it is understood that several establishments are preparing to take advantage of the guarantee provided by the Government and are going into business on a large scale, with special steamers fitted up for the traffic and warehouses in England and France. Consul Baker is of the opinion that Argentine beef can never compete seriously with United States shippers unless improved methods are adopted in its preparation for market.

The harness manufacturers of this city and vicinity have organized to prevent the selling of goods by wholesale harness houses at retail prices.



### Building Heavy Boilers on the Pacific.

The screw steamship *Australia*, of the Oceanic Steamship Company, of which J. D. Spreckels Bros. are the managing owners, says the *San Francisco Mining and Scientific Press*, has for the past two months been laid up for the purpose of converting her old machinery, which was on the compound principle, and using steam of 75 pounds pressure, into the modern system of triple expansion, using steam at 160 pounds above atmospheric pressure. The contract for the conversion was intrusted to the Risdon Iron and Locomotive Works, and is now rapidly approaching completion.

The boilers of the *Australia* are two in number, 14 feet 4 inches mean diameter, 16 feet 4½ inches long. Each boiler is fitted with six of Fox's corrugating furnaces 3 feet 4 inches mean diameter, 17-32 thick, having one fire-box common to each pair of through furnaces. The furnace fronts are flanged outward, thereby affording the means (which is highly essential) of hydraulic riveting. The back end of the furnace is flanged upward to take the tube-sheet (the latter is 29-32 thick), so that in the event of a furnace crown collapsing no difficulty arises in replacing the furnace, seeing that the furnace mouth is larger in diameter than the outside corrugation, and cutting at the back ends affords attachment for new furnace.

With the exception of tubes and braces, the boilers are constructed entirely of steel manufactured under the Siemens-Martin process. The shell plating, which is 1½ inches thick, having tensile strength of 62,720 pounds, is built up of three courses, having two plates in each course. The longitudinal seams are fitted with butt straps inside and out and are treble-riveted, with the exception of end courses, which are double-riveted; the circular seams are also treble-riveted. With the exception of the forward end circumferential seam, the whole of the riveting on shell and ends is hydraulic riveting. The machine used for this purpose was built in San Francisco, and exerts a pressure upon the rivet of 150 tons to the square inch. Where practicable, the riveting of the fire-boxes is also hydraulic. The fire-box plating is composed of ½-inch plates, excepting bottom, which is ¾, and is single-riveted to tube-sheets. The plates forming the tops and sides of each fire-box are in one piece, so that only two plates form the outside of the box. The roof is efficiently supported by crossbars having braces screwed through the plate with nuts and washers inside. The sides are supported with braces screwed through the shell and also to each other. Each brace is protected with iron ferrules, in conformity with the United States Government requirements.

The flat part of the ends in the steam space are supported with wrought-iron braces 2½ inches in diameter, having plate-washers 10 inches in diameter outside, with nuts inside and outside. The tubes are 3½ inches external diameter, No. 8 thick; the number in each boiler, 616. Every alternate tube vertically and fourth horizontally is fitted as a stay screwed through the front and back tube-plates and beaded over at both ends, this plan having proved more efficient than that of fitting nuts, which are liable to burn away. These tubes are ¾ inch thick, and together with the plain tubes were expended by roller mandril. The whole of the plating is calked inside and out on the approved principle. The boilers have been constructed to conform to United States, Lloyds' Registry and British Board of Trade requirements for a working pressure of 160 pounds above the atmosphere. With this pressure it is estimated, with the

ample grate and heating surfaces provided, that the *Australia*, in ordinary work and with coal of average quality, will develop 2300 indicated horse-power, and this upon a coal consumption of 39½ tons per diem. The previous horse-power of the ship was 1800, with a consumption of 50 tons per diem. With the new machinery the ship is estimated to attain 13½ knots per hour. The heating surfaces are as follows:

Tubes.....	6814.2
Furnaces.....	482.5
Fire-boxes.....	516.4
Tube-plates.....	283.1

Total in two boilers.....	7896.2
Total fire-grate area in two boilers.....	234 sq. ft.
Ratio of heating surface to grate area.....	33.7:1

Each boiler is fitted with Cockburn's spring-loaded safety-valves—three to a set—and are 4½ inches diameter. All the valves can be eased from stoke-hold platform, and can be turned round while under steam. Main stop-valves, with brass internal steam-pipes, are provided on both boilers, 7 inches diameter, shutting off steam from engines and from each other. Surface, bottom, blow-off and drain cocks are also fitted together with a double set of water-gauges and test-cocks, having cocks at extremities of pipes on boilers. The main and donkey feeds enter at the after end of the boilers, and are so fitted that either valve can be overhauled while under steam. Internal pipes carrying the feed away from the furnaces over the tubes are also fitted. There is connection with non-return-valves on both boilers providing steam of reduced pressure into winch range.

As too much care cannot be exercised in raising steam in these high-pressure boilers, in order to reduce the possibility of leakage at bottoms to a minimum Clarke's patent circulators, with steam connection from winch boilers, are supplied. Steam jets for blowing tubes at sea or in port are fitted. The fire-doors are constructed on Martin's principle, and to the firemen are a great boon. They are perfectly balanced and open upward, so that a touch with the firing shovel is all that is required to open or close them, while in cleaning or slicing a fire they can be opened to the required height, and so prevent the intense heat from attacking the fireman, as is the case with the common swing-back door, which is a decided nuisance in a heavy sea. Ash-pit dampers and pricker-bars are fitted as usual. The fire-bars are of the ordinary type, in two lengths, supported on the ordinary dead-plate in front and on Tucker's patent bridge walls at back end. The smoke-stack is also fitted with a damper worked from stoke-hold platform. All the steam and feed pipes are of hammered copper, having spigoted flanges on the locomotive principle, and the flanges of steam-pipes are brazed and further secured with rivets. The boilers with their mountings in place have been subjected by hydrostatic test to a pressure of 320 pounds to the square inch (twice the working pressure) before leaving the works, and no evidence of weakness was discernible. The whole work proved to be perfectly staunch and water-tight.

**Rapid Transportation for Letters, &c.**—A large number of business men and scientists gathered at Boston last week to inspect and witness the performance of the pneumatic tube invented by John T. Williams, who was present to explain his new system of rapid transportation. Mr. Williams' plan is to erect a single-track elevated structure which is to carry a small car for the transportation of small packages and letters, the motive-power being electricity. It is urged that this system would greatly facilitate the mail service, and that by its use mails could be forwarded every five minutes between such

points as New York and Boston, the journey in this case being something less than two hours. Even the small shuttle-like carriage used to illustrate the system in Boston, some 4 feet long and weighing 56½ pounds, could carry 1000 letters, which, dispatched every five minutes, would accomplish the present daily work between the New York and Boston post-offices. The power proposed is an Edison incandescent circuit of 110 volts. There is ½ horse-power propelling the carriage at the start, and in such a distance as that from New York to Boston it is estimated that sufficient power could be furnished by five or six stations placed at equal intermediate distances. There appears to be no limit to the speed attained by this system, and the field for the invention is apparently unbounded.

The Pullman Palace-Car Company have again sued the Wagner Palace-Car Company, W. S. Webb, the president, and the Lake Shore and Michigan Southern Railway Company, this time to restrain the railroad company from using the vestibule itself as a completed structure. George M. Pullman has secured letters patent on the structure, the application having been for two years before the patent examiners. The vestibule was in actual use in May, 1887. A suit involving the face-plates was recently decided in favor of the Pullman Company, and if successful in this suit the company will have a complete monopoly of vestibule connections for railway cars.

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# CURRENT HARDWARE PRICES.

JUNE 5, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Cape, Percussion, 1000—

Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimm'd Edge, 1-10's.....	25¢
E. B. Grnd. Edge, Cent. Fire.....	75¢
Double Waterproof, 1-10's.....	1.40
Musket Waterproof, 1-10's.....	50¢
G. D. ....	25¢
S. B. ....	30¢

Union Metallic Cartridge Co.

F. C. Trimm'd.....	50¢
F. L. Ground.....	85¢
Cent. Fire Ground.....	70¢
DBL. Waterproof.....	1.40
DBL. Waterproof, in 1-10's.....	1.40
S. B. Genuine Imp.orted.....	45¢
Eley's E. B. ....	54¢
Eley's D Waterproof, Central Fire.....	1.60

Cartridges.

Rim Fire Cartridges.....	50¢
Rim Fire Military.....	15¢
Cent. Fire Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	15¢

Blank Cartridges, except 22 and 32 cal.

Blank Cartridges, 22 cal., 1.75.....	2¢
Blank Cartridges, 32 cal., 3.50.....	2¢
Primed Shells and Bullets.....	15¢
B. B. Cape, Round Ball, 1.75.....	2¢
B. B. Cape, Con. Ball, Swgd., 2.00.....	2¢

Primers.

Berdan Primers, 1.00.....	2¢
B. L. Cape (for Sturtevant Shells) 1.00.....	2¢
All other Primers, 1.20.....	2¢

Shells—

First quality, 4, 8, 10 and 12 gauge.....	25¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢

Star, Club, Rival and Climax brands,

10 and 12 gauge.....	35¢
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Club, Rival and Climax brands, 14, 16

and 20 gauge.....	30¢
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Seibold's Comb. Shot Shells.....

15¢
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Brass Shot Shells, 1st quality.....

60¢
-----

Brass Shot Shells, Club, Rival, Climax.....

65¢
-----

I. X. L. 10 and 12 gauge.....

40¢
-----

"Special" 16 gauge.....

30¢
-----

"Special" 10 and 12 gauge.....

40¢
-----

Fowler's Pat.....

35¢
-----

Shells Loaded—

A. M. Co. List No. 19, 1887.....	20¢
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Wads—

U. M. C. & W. R. A.—B. E., 11 up.....	2.00
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U. M. C. & W. R. A.—B. E., 9 to 10.....	2.30
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U. M. C. & W. R. A.—B. E., 7 & 8.....	2.80
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U. M. C. & W. R. A.—P. E., 11 up.....	3.10
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U. M. C. & W. R. A.—P. E., 9 to 10.....	4.00
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U. M. C. & W. R. A.—P. E., 7 & 8.....	4.90
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Eley's B. E., 11 up.....	1.75
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Eley's P. E., 11 up.....	2.80
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Anvils—

Eagle Anvil, 10¢.....	20¢
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Peter Wright's.....	9¢
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Armstrong's Mouse Hole.....	8¢
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Armstrong's Mouse Hole, Extra.....	11¢
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Trenton.....	9¢
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Wilkinson's.....	11¢
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J. & Riley Carr, Pat. Solid.....	11¢
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Moore & Barnes Mfg. Co.....	35¢
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Anvil Vice and Drill—

Millers Falls Co., 18.00.....	20¢
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Cheney Anvil and Vice.....	25¢
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Allen Anvil and Vice, 33.00.....	40¢
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Apple Parers—

Advance.....	50¢
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Antim Combination.....	50¢
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Baldwin.....	50¢
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Champion.....	75¢
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Eureka, 1888.....	17.00
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Family Bay State.....	12.00
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Gem.....	5.25
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Gold Medal.....	4.00
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Hudson's New '88.....	3.75
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Ideal.....	4.75
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Improved Bay State.....	30.00
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Little Star.....	4.25
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Monarch.....	13.50
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New Lightning.....	5.50
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Orion.....	4.00
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Penn.....	4.00
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Perfection.....	4.00
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Pomona.....	4.00
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Augers and Bits—

Douglas Mfg. Co.....	70¢
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Wm. A. Ives & Co.....	70¢
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Humphreysville Mfg. Co.....	70¢
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French, Swift & Co. (F. H. Beecher, Bookford Bit Company.....	55¢
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Cook's, Douglas Mfg. Co.....	55¢
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Cook's, N. H. Copper Co.....	50¢
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Ives' Circular Lip.....	80¢
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C. E. Jennings & Co., No. 10, extension lip.....	40¢
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C. E. Jennings & Co., No. 30.....	60¢
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C. E. Jennings & Co., Auger Bits, 1/2 set.....	85¢
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3/4 set, No. 5, 3/4; No. 30, 3/4.....	20¢
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Lewis' Patent Single Twist.....	45¢
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Jennings' Augers and Bits.....	60¢
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Imitation Jennings' Bits.....	60¢
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Pugh's Black.....	20¢
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Rockford, Jennings' Pattern.....	60¢
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Car Bits.....	50¢
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L. Hommedieu Car Bits.....	15¢
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Forester Pat. Auger Bits.....	10¢
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Rocking Table.....	50¢
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Turntable.....	40¢
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Victor.....	13.50
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Waverly.....	4.50
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White Mountain.....	4.50
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72.....	4.25
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76.....	5.75
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78.....	6.50
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## Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas'.....	40¢
Bonney's Adjustable, 1/2 doz.....	48¢
Stearns'.....	20¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

## Expansive Bits—

Clarks' small, 1/8; large, 3/8.....	35¢
Ives' No. 4, 1/2 doz.....	40¢
Swan's.....	40¢
Stearns' No. 1, 3/8; No. 2, 3/8.....	20¢
Stearns' No. 2, 3/8.....	20¢

## Gimlet Bits—

Common.....	7¢
Diamond.....	10¢
Bee.....	25¢
Double Cut, Sheppardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 1/2 doz.....	35¢
Double Cut, Douglas'.....	40¢
Double Cut, Ives'.....	60¢

## Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	10¢
Williams' or Holt's, for wood.....	40¢

## Ship Augers and Bits—

L'Hommiedieu's.....	15¢
Watrous'.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

## Awl Hafts—

Sewing, Brass Fer. 1/2 gr.....	35¢
Pat. Sewing, Short.....	40¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top, 1/2 gr.....	10¢
Pat. Peg, Leather Top, 1/2 gr.....	12¢

## Awls, Brad Sets, &c—

Awls, Sewing, Common 1/2 gr.....	17¢
Awls, Should. Peg, 1/2 gr.....	24¢
Awls, Pat. Peg, 1/2 gr.....	63¢
Awls, Shouldered Brad, 2 1/2 gr.....	35¢
Awls, Handled Brad, 1/2 gr.....	45¢
Awls, Handled Scratch, 1/2 gr.....	55¢
Awls, Socket Scratch, 1/2 gr.....	15¢

## Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	55¢
Pray's Adj. Tool Hds., No. 1, 1/2; 2, 1/2; 3, 1/2; 4, 1/2.....	25¢
Miller's Falls Adj. Tool Hds.....	25¢
No. 1, 1/2; 2, 1/2.....	25¢
Henry's Combination Haft.....	50¢
Brad Sets.....	40¢
No. 42, 10.50; No. 43, 12.50.....	70¢
Stanley's Excelsior.....	30¢
No. 1, 7.50; No. 2, 4.00; No. 3, 5.50.....	30¢

## Axes—

First quality.....	50¢
Others.....	55¢

## Makers' and Special Brands—

First quality.....	50¢
Others.....	55¢

## Axle Grease—

Fraser's.....	4¢
Fraser's, in boxes.....	5¢
Dixon's Everlasting, in bxs.....	1¢
Dixon's Everlasting, 10-lb pails, ea.....	85¢
Lower grades, special brands.....	70¢

## Axles—

No. 1.....	4¢
No. 7 to 14.....	5¢
No. 15 to 18.....	47¢
No. 19 to 25.....	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	35¢
Less than 10 sets.....	35¢
Over 10 sets.....	35¢

## Bag Holders—

Sprengle's Pat.....	10¢
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## Balances—

Spring Balances.....	50¢
Common 24 lb.....	15¢
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells—

### Hand—

Light Brass.....	70¢
Extra Heavy.....	60¢
White Metal.....	60¢
Shiver Chime.....	35¢
Globe (Cone's Patent).....	25¢

### Door—

Gong, Abbe's.....	35¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Crank, Taylor's.....	25¢
Crank, Brooks'.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's Bronzed or Plated.....	25¢
Lever, Taylor's Japanned.....	25¢
Lever, R. E. M. Co.'s.....	50¢
Pull, Brooks'.....	50¢
Pull, Western.....	25¢

## Cots—

Common Wrought.....	80¢
Western Sargent's list.....	70¢
Kentucky, "Star".....	70¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	50¢
Steel Alloy Church and School Bells.....	40¢

## Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

## Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	60¢

## Bench Steps—

Morrill's.....	50¢
Hotchkiss'.....	50¢
Weston's, No. 1, 10; No. 2, 20.....	10¢
McGill's.....	10¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.
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## Bit Holders—

Extension.....	40¢
Barber's.....	40¢
Ives'.....	40¢
Diagonal.....	40¢
Angular.....	40¢

## Blind Adjusters—

Domestic.....	30¢
Excelsior.....	10¢
Washburn's Self-Locking.....	20¢

## Blind Fasteners—

### Blind Fasteners-

Mackrell's, ¢ doz.	\$1.00.....	20¢	20¢	10¢
Van Sand's Screw Pat.,	15 ¢ gr.....	60¢	10¢	
Van Sand's Old Pat.,	\$15.00 ¢ gr.....	55¢	10¢	
Washburn's Old Pattern,	¢ gr.....	\$9.00		
Merriman's.....		new list		
Austin & Eddy No. 2008,	¢ gr.....	\$9.00		



<b>Cross-Cut Saw Handles—</b>	
Atkins' No. 1 Loop, # pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.	
Boynton's Loop Saw Handles, 50¢.	80¢
Champion.....	15¢
<b>Hangers—</b>	
Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England.....	60¢10¢10¢70¢
Samson Steel Anti-Friction.....	55¢
Orleans Steel.....	55¢
Hamilton Wrought Wood Track.....	55¢
U. S. Wood Track.....	65¢
Champion.....	60¢10¢
Rider and Wooster, Medina Mfg. Co.'s List.....	70¢
Climax Anti-Friction.....	80¢
Limax Anti-Friction for Wood Track.....	55¢
Zenith for Wood Track.....	55¢
ed's Steel Arm.....	50¢
allenge, Barn Door.....	50¢
Sterling's Imp'ved (Anti-Friction).....	65¢10¢
Victor, No. 1, \$15.00; No. 2, \$15.00; No. 3, \$18.00.....	60¢25¢
Cheritree.....	50¢10¢
Kidder's.....	50¢10¢
The Boss.....	60¢10¢
Best Anti-Friction.....	60¢10¢
Duplex (Wood Track).....	60¢10¢
Terry's Pat., # doz pr. 4, \$10.00; 5 in. \$12.00.....	50¢25¢50¢10¢
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40.....	50¢
No. 6, \$18.00.....	50¢
Wood Track Iron Clad, # ft. 10¢.....	60¢
Carrier Steel Anti-Friction.....	50¢50¢25¢
Architect, # set \$5.00.....	20¢
Elipse.....	20¢10¢
Felix, # set \$4.50.....	20¢
Richards.....	30¢50¢10¢
Lane's Steel Anti-Friction.....	50¢10¢
Best Bearing Door Hanger.....	30¢10¢25¢10¢
Warner's Pat.....	20¢50¢10¢
Stearns' Anti-Friction.....	20¢50¢10¢
Stearns' Challenge.....	25¢10¢25¢10¢10¢
Faultless.....	40¢40¢25¢
American, # set \$6.00.....	30¢10¢
Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Paragon, Nos. 5, 6, 7 and 8.....	30¢10¢
Crescent.....	60¢50¢10¢
Nickel, Cast Iron.....	50¢
Nickel, Malleable Iron and Steel.....	40¢
Scranton Anti-Friction Single Strap.....	30¢
Scranton Anti-Friction Double Strap.....	40¢
Universal Anti-Friction.....	40¢
Wild West, 4 in. Wheel, \$15.00; 6 in. Wheel, \$21.00.....	40¢
Star.....	40¢10¢40¢10¢25¢
May.....	50¢25¢50¢10¢
Barry, \$6.00.....	40¢10¢
<b>Harness Snaps—</b>	
See Snaps.....	
<b>Hatchets—</b>	
List Jan. 1, 1888.....	35¢40¢
Isiah Blood.....	35¢40¢
Hunt's Shingling, Lath and Claw.....	40¢25¢
Hunt's Broad.....	40¢10¢
Buffalo Hammer Co.....	40¢10¢50¢
Hurd's.....	40¢10¢50¢
Fayette R. Plumb.....	40¢10¢50¢
Wm. Mann, Jr., & Co.....	50¢50¢25¢
Underhill Edge Tool Co.....	40¢50¢40¢10¢
Underhill's, Haines and Bright.....	35¢40¢
C. Hammond & Son.....	40¢10¢50¢
Stannons.....	40¢10¢50¢
Peck's.....	40¢10¢50¢10¢25¢
Kelly's.....	50¢50¢25¢
Sargent & Co.....	50¢
Ten Eyck Edge Tool Co.....	40¢10¢40¢10¢25¢
Collins.....	10¢
Schulte, Lohoff & Co.....	50¢50¢25¢
<b>Hay and Straw Knives—</b>	
Lightning, Mfrs. price # doz \$18.00, 25¢ But jobbers frequently give extra.	
Gem.....	# doz \$10
Wadsworth's.....	40¢75¢40¢10¢
Carter's Needle.....	# doz \$11.50¢12.00
Heath's.....	# doz \$13.50¢14.00
Auburn Hay, Com. and Spear Point.....	40¢
Auburn Hay.....	40¢
Nolin's Hay.....	# doz \$10.00
<b>Hinges—</b>	
<b>Wrought Iron Hinges</b>	
Strap and T.....	75¢5¢75¢10¢
Screw Hook and.....	9 to 12 in. # b. 34¢
Strap.....	14 to 20 in. # b. 34¢
Strap.....	22 to 36 in. # b. 34¢
Heavy Welded.....	6 to 12 in. # b. 34¢
Hook.....	14 to 20 in. # b. 34¢
Hook.....	22 to 36 in. # b. 34¢
Screw Hook.....	14 in. # doz \$2.45
and Eye.....	14 in. # doz \$2.50
Roller Blind Hinges, Nos. 32 and 34.....	50¢10¢
Roller Blind Hinges, Nos. 232 and 234.....	50¢10¢
Roller Plate.....	55¢10¢
Roller Plate.....	70¢10¢
Plate Hinges, 8, 10 & 12 in. # b. 45¢ "Providence", over 12 in. # b. 45¢	
<b>Spring Hinges—</b>	
Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co.'s list, March, 1888.....	20¢
Acme and U. S.....	30¢
Empire and Crown.....	30¢
Hero and Monarch.....	50¢
American, Gem, and Star, Japanned.....	30¢
American, Gem, and Star, Branned.....	30¢
Oxford, Bronze and Brass.....	30¢
Barker's Double Acting.....	20¢10¢
Union Mfg. Co.....	25¢
Bonner's.....	30¢
Buckman's.....	15¢20¢
Chicago.....	30¢
Wiles.....	10¢
Devore's.....	40¢
Rex.....	40¢
Royal.....	60¢
Reliable.....	60¢
Champion.....	60¢
<b>Gate Hinges—</b>	
Western.....	# doz \$4.40, 60¢
N. E.....	# doz \$7.00, 55¢
N. E. Reversible.....	# doz \$5.20, 55¢10¢
Clark's, Nos. 1, 2, 3.....	60¢10¢25¢
N. Y. State.....	# doz \$5.50, 55¢10¢
Automatic.....	# doz \$12.50, 55¢10¢
Common Sense.....	# doz pair \$4.50, 50¢
Seymour's.....	45¢10¢
Shepard's.....	60¢10¢25¢
Reed's Latch and Hinges.....	# doz \$12.00, 50¢
<b>Blind Hinges—</b>	
Parker.....	75¢25¢
Palmer.....	50¢55¢10¢
Seymour.....	70¢25¢
Nicholson.....	45¢10¢
Huffer.....	50¢
Clark's, Nos. 1, 3, 5, 40 and 50.....	75¢10¢25¢80¢
Clark's Mortise Gravity.....	50¢
Sargent's, Nos. 1, 3, 5, 11, 13.....	75¢10¢55¢10¢25¢
Sargent's Gravity.....	75¢10¢75¢10¢25¢
Shepard's.....	75¢10¢25¢
Noiseless.....	75¢10¢25¢
Niagara.....	80¢25¢
Buffalo.....	80¢25¢
Clark's Genuine Pat.....	80¢25¢
O. S. Lull & Porter.....	75¢10¢
Acme, Lull & Porter.....	75¢25¢
Queen City Reversible.....	75¢
Clark's Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3.....	75¢10¢25¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50.....	25¢25¢
<b>Rees—</b>	
<b>Handled—</b>	
Garden, Mortar, &c.....	65¢
Planter's, Cotton, &c.....	65¢
Warren, Hoe.....	60¢
Magie.....	# doz \$4.00
<b>Eye—</b>	
D. & H. Scovill.....	20¢
Lane's Crescent Planter Pattern.....	45¢25¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢25¢
Sandusky Tool Co., S. & O. Pat.....	60¢
Hubbard & Co., S. & O. Pat.....	60¢
Chattanooga Tool Co., S. & O. Pat.....	60¢
Grub.....	60¢60¢10¢
<b>Hog Rings and Rings—</b>	
Hill's Improved Rings.....	# doz \$4.25
Hill's Old Style Rings.....	# doz \$2.75
Hill's Tongs.....	# doz \$4.50
Hill's Rings.....	# doz bxs \$2.15¢2.25
Perfect Rings.....	# doz bxs \$1.60¢1.70
Blair's Hog Rings.....	# doz \$2.25¢2.50
Champion Rings.....	# doz \$2.00
Champion Rings, Double.....	# doz \$2.25
Brown's Rings.....	# doz \$2.00
Brown's Rings.....	# doz \$1.25¢1.30
<b>Hoisting Apparatus—</b>	
Moore's Hand Hoist, with Lock.....	20¢
Moore's Differential Pulley Block.....	40¢
Energy Mfg. Co.'s.....	25¢
<b>Holders, File and Tool—</b>	
Bals Pat.....	# doz \$4.00; 25¢
Nicholson File Holders.....	25¢
<b>Hollow-Ware—</b>	
<b>Iron—</b>	
Stove Hollow-Ware.....	60¢60¢25¢
Ground.....	60¢10¢50¢10¢10¢
Unground.....	60¢10¢50¢10¢10¢
Boilers and Saucepans.....	40¢25¢
Tinned Boilers and Saucepans.....	40¢
Gray Enamelled-Ware.....	45¢50¢
Stove.....	60¢10¢50¢10¢
Maslin Kettles.....	60¢10¢50¢10¢10¢
Boilers and Saucepans.....	40¢25¢
Agate and Granite Ware, list Jan. 1, 1889.....	35¢40¢10¢
Rustless Hollow-Ware.....	50¢50¢25¢
Galvanized Tea-Kettles.....	50¢
Inch..... 6 7 8 9	
Each..... 55¢ 60¢ 65¢ 75¢	
<b>Silver Plated—</b>	
4 mo. or 5¢ cash in 30 days.....	
Reed & Barton.....	40¢25¢
Meriden Britannia Co.....	40¢25¢
Simpson, Hall, Miller & Co.....	40¢25¢
Rogers & Brother.....	40¢25¢
Hartford Silver Plate Co.....	40¢25¢
William Rogers Mfg. Co.....	40¢25¢
<b>Hooks—</b>	
<b>Cast Iron—</b>	
Bird Cage, Sargent's list.....	60¢10¢10¢
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's list.....	60¢10¢10¢
Clothes Line, Reading list.....	60¢10¢10¢10¢10¢
Ceiling, Sargent's list.....	55¢10¢10¢
Harness, Reading list.....	55¢10¢10¢10¢10¢
Coat and Hat, Sargent's list.....	55¢10¢60¢10¢
Coat and Hat, Reading.....	50¢10¢50¢10¢10¢
<b>Wrought Iron—</b>	
Cotton.....	# doz \$1.25
Cotton Pat. (N.Y. Mallet & Handle Wks.).....	30¢
Tassel and Picture (T. & S. Mfg. Co.).....	30¢
Wrought Staples, Hooks, &c.....	See Wrought Goods.
<b>Wire—</b>	
Wire Coat and Hat, Gem, list April, 1888.....	45¢
Wire Coat and Hat, Miles, list April, 1888.....	45¢
Indestructible Coat and Hat.....	45¢
Wire Coat and Hat, Standard.....	45¢
Belt.....	75¢10¢80¢
<b>Miscellaneous.</b>	
Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50 Nolin's Grass.....	# doz \$2.25
Bush.....	55¢60¢
Whittemore Patent.....	55¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	60¢10¢10¢
Fish Hooks, American.....	60¢
Bench Hooks.....	See Bench Stops.
<b>Horse Nails—</b>	
Nos. 6 7 8 9 10	
Ausable.....	25¢ 25¢ 25¢ 24¢ 23¢
Lyra.....	25¢ 23¢ 23¢ 21¢ 20¢
Snowden.....	25¢ 23¢ 23¢ 21¢ 20¢
Putnam.....	33¢21¢ 20¢ 19¢ 18¢
Vulcan.....	23¢ 21¢ 20¢ 19¢ 18¢
Northwest.....	23¢ 21¢ 20¢ 19¢ 18¢
Globe.....	10¢10¢25¢
Boston.....	23¢ 21¢ 20¢ 19¢ 18¢
A. C.....	25¢ 23¢ 23¢ 21¢ 20¢
C. B.-K.....	25¢ 23¢ 23¢ 21¢ 20¢
Champlain.....	25¢ 6¢ 25¢ 24¢ 23¢
New Haven.....	25¢ 23¢ 23¢ 21¢ 20¢
Saranac.....	23¢ 21¢ 20¢ 19¢ 18¢
Champion.....	25¢ 23¢ 23¢ 21¢ 20¢
Capewell.....	23¢ 21¢ 20¢ 19¢ 18¢
Star.....	23¢ 21¢ 20¢ 19¢ 18¢
Anchor.....	23¢ 21¢ 20¢ 19¢ 18¢
Western.....	23¢ 21¢ 20¢ 19¢ 18¢
Empire Branded.....	14¢ 14¢
<b>Horse Shoes—See Shoes Horse.</b>	
<b>Hose, Rubber—</b>	
Competition.....	75¢10¢75¢10¢25¢
Standard.....	70¢70¢10¢
Extra.....	60¢60¢10¢
N. Y. B. & P. Co., Para.....	50¢
N. Y. B. & P. Co., Extra.....	50¢
N. Y. B. & P. Co., Dundee.....	60¢10¢25¢
<b>Huskers—</b>	
Blair's Adjustable.....	# gr \$8.00
Blair's Adjustable Clipper.....	# gr 7.00
<b>Indurated Fiber-Ware.</b>	
Spittoons, No. 2, # doz.....	\$6.75
Basins, Ringed, # doz, No. 1, \$3.70; No. 2, \$3.10; No. 3, \$2.70.....	
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), # doz, nests.....	\$16.87
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), # doz, nests.....	\$8.37
Butter Bowls 16, 17 and 19-inch (3 pieces), # doz, nests.....	\$6.75
Liquid Measures, pt., qt., 2 qt. and fun. nell (4 pieces), # set.....	\$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), # set.....	\$3.25
<b>See also Putts.</b>	
<b>Jack Screws—See Screws.</b>	
<b>Kettles—</b>	
Spun, Stamped.	
Brass, 7 to 17 in. # b.....	24¢ 21¢
Brass larger than 17 in.....	26¢ 23¢
# b.....	See Hollow-Ware.
<b>Keys—</b>	
Lock Ass'n list Dec. 30, 1886.....	50¢10¢
Eagle, Cabinet, &c.....	35¢42¢
Hotchkiss' Brass Blanks.....	40¢
Hotchkiss, Copper and Tinned.....	40¢
Hotchkiss' Pad and Cab.....	35¢
Ratchet Bed Keys.....	# doz \$4.00, 15¢
Wollensak Tinned.....	50¢10¢
<b>Knife Sharpeners—</b>	
Parkin's.....	Applewood Handles, # doz \$6.00, 40¢
Rosewood or Cocobolo.....	# doz \$6.00, 40¢
<b>Knives—</b>	
Wilson's Butcher Knives.....	25¢30¢
Ames' Butcher Knives.....	25¢
Foster Bros' Butcher, &c.....	40¢
Nichols' Butcher Knives.....	40¢10¢
Ames' Shoe Knives.....	30¢25¢
Ames' Bread Knives, # doz \$1.50, 15¢20¢	
Moran's Shoe and Bread.....	50¢
Table and Pocket.....	See Hay Knives
Corn, Auburn Mfg. Co. Western Pat.....	\$2.00
Corn, Auburn Mfg. Co. Crescent.....	\$2.50
<b>Knobs—</b>	
Door Mineral.....	65¢68¢
Door Por. Jap'd.....	75¢78¢
Door Por. Nickel.....	\$2.00¢2.25
Door Por. Plated, Nickel.....	\$2.00¢2.25
Drawer, Porcelain.....	60¢10¢60¢10¢10¢
Hemacite Door Knobs.....	40¢10¢50¢
Yale & Towne Wood, list Dec., 1885.....	40¢
Furniture Plain.....	75¢ gro iron, 10¢
Furniture, Wood Screws.....	25¢10¢
Base, Rubber Tip.....	70¢10¢25¢
Picture, Judd's.....	60¢10¢10¢70¢
Picture, Sargent's.....	70¢10¢
Picture, Hemacite.....	35¢25¢
Shutter, Porcelain.....	65¢10¢
Carriage, Jap.....	# gro 80¢, 60¢10¢
<b>Ladies—</b>	
Melting, Sargent's.....	55¢10¢
Melting, Reading.....	35¢10¢
Melting, Monroe's Pat.....	# doz \$4.00, 40¢
Melting, P. S. & W.....	35¢10¢40¢
Melting, Warner's.....	30¢
<b>Lawn Mowers—</b>	
Standard list.....	50¢10¢
Quaker City.....	60¢10¢
Enterprise.....	60¢10¢
<b>Lanterns—</b>	
<b>Tubular—</b>	
Plain with Guards, # doz.....	\$4.00¢4.25
Lift Wire, with Guards.....	\$4.50¢4.75
Square Plain, with Guards.....	\$4.00¢4.25
Sq. Lift Wire, with Guards.....	\$4.25¢4.50
Without Guards, 25¢ # doz less.	
<b>Miscellaneous.</b>	
Police, Small, \$6.00; Medium, \$7.25; Large, \$9.75.....	20¢25¢
<b>Lemon Squeezers—</b>	
Porcelain Lined, No. 1.....	# doz \$6.00, 25¢30¢
Wood, No. 2.....	# doz \$3.00, 35¢
Wood, Common.....	# doz \$1.70¢1.75
Dunlap's Improved.....	# doz \$3.75, 30¢
Sammis.....	No. 1, \$5.00; No. 2, \$6; 12, \$18 # doz.....
Jennings' Star.....	# doz \$2.50
The Boss.....	# doz \$2.50
Dean's, Nos. 1, # doz \$6.50; 2, \$8.35; 3, \$1.90.....	
Little Giant.....	50¢50¢25¢
King.....	40¢25¢
<b>Lines—</b>	
Cotton and Linen Fish, Draper's.....	50¢
Draper's Chalk.....	60¢

Melasses Gates—		Plane Irons—		Razors—		Atkins' Silver Steel Diamond X Cuts	
Stebbin's Pat.	70¢/70¢/71¢	Plane Irons, 20¢/10¢	20¢/10¢	J. R. Torrey Razor Co.	20¢	Atkins' Special Steel Dexter X Cuts	foot 70¢
Stebbin's Genuine	60¢/10¢/10¢	Plane Irons, Buck Bros.	80¢	Wootenholme and Butcher, \$10.00 to 2	10¢	Atkins' Special Steel Diamond X Cuts	foot 80¢
Stebbin's Tinned Ends	50¢/10¢	Plane Irons, Auburn Tool Co., "This- tle"	40¢	Razor Straps—		Atkins' Champion and Electric Tooth X Cuts	foot 27¢/23¢
Chase's Hard Metal	50¢/10¢	Sandusky Tool Co.	30¢	Genuine Emerson	60¢/60¢/5¢	Atkins' Hollow Back X Cuts	foot 18¢
Bush's	50¢/10¢	Single and Cut	40¢	Imitation	50¢/50¢/50¢	Atkins' Muley, Mill and Drag	40¢
Lincoln's Pattern	70¢/70¢/10¢	Double	40¢	Torrey's	20¢	W. M. & C. Hand	30¢/30¢/10¢
Weed's	20¢/10¢	L. & I. J. White	25¢	Badger's Belt and Com	50¢/50¢/50¢	W. M. & C., Champion X Cuts, Regu- lar	foot 24¢/30¢
Boss, 5¢; No. 1, 7¢; No. 2, 8¢; No. 3, 9¢; No. 4, \$10.	50¢/10¢/10¢	Pliers and Nippers—		Lamont Combination	50¢/50¢/50¢	W. M. & C. X Cuts, Thin Back	foot 27¢/30¢
Money Drawers—		Button's Patent	30¢/10¢/40¢	Rivets and Barre—		Peace Circular and Mill	45¢/10¢
Muzzies—		Hall's No. 2, 3 in., \$13.50; No. 4, 7 in., \$21.00	50¢/10¢/30¢	Iron, list Nov. 17, '87	50¢	Peace Hand Panel and Rip	20¢/10¢/30¢/10¢/10¢
Safety	50¢/50¢/25¢	Humason & Beckley Mfg. Co.	50¢/50¢/10¢	Copper	50¢/10¢/60¢	Peace Cross Cuts, Standard	foot 25¢
Nails, see Trade Report.		Gas Pliers, Custer's Nickel Plated	60¢/5¢	Rivet Sets		Peace Cross Cuts, Thin Back	foot 27¢/23¢
Wire Nails & Brads, list July 14, '87	70¢/10¢	Eureka Pliers and Nippers	40¢/40¢	Rods—		Richardson's Circular and Mill	45¢/45¢/10¢
Wire Nails, Standard Penny	22.50¢/22.50¢	Russell's Parallel	25¢	Stair, Brass	25¢/25¢	Richardson's X Cuts	No. 1, 30¢; No. 2, 27¢; No. 3, 24¢
Nail Puller—		P. S. & W. Cast Steel	50¢	Stair, Black Walnut	50¢/40¢	Hack Saws—	
Curtiss Hammer	50¢/50¢/00	Carew's Pat. Wire Cutters	30¢	Rollers—		Griffin's, complete	40¢/10¢/50¢
Giant, No. 1	50¢/50¢/10¢	Morrill's Parallel	50¢/12.00	Barn Door, Sargent's list	60¢/10¢/10¢	Griffin's Hack Saw, Blades	40¢/10¢/50¢
Pelican	50¢/50¢/25¢	Cronk's 8 in., \$15.00; 10 in., \$21.00	40¢/40¢/25¢	Acme Moore's Anti-Friction	55¢	Star Hack Saws and Blades	35¢
Boss	50¢/50¢/30¢	Plumbs and Levels—		Union Barn Door Roller	70¢	Diamond Hack Saws and Blades	35¢
Lighting	50¢/50¢/10¢	Regular List	70¢/10¢/70¢/10¢/10¢	Rope—		Eureka and Crescent	25¢
Nail Sets—		Disston's	45¢/10¢	Manufacturers' prices for large lots:		Saw Frames—	
Square	50¢/50¢/4.00¢/4.25¢	Pocket Levels	70¢/10¢/70¢/10¢/10¢	Manila, 1/4 in. and larger	15¢/15¢	White Vermont	50¢/50¢/10.00
Round	50¢/50¢/50¢	Davis Iron Levels	30¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Red, Polished and Varished	1.50, 25¢
Cannon's Diamond Point	50¢/50¢/12.20¢	Davis Incl.ometers	10¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Saw Sets—	
Nut Crackers—		Pelish, Metal	30¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Stillman's Genuine	50¢/50¢/7.75
Table (H. & M. Mfg. Co.)	40¢	Krestoline Paste	30¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Stillman's Imita.	50¢/50¢/6.25
Blake's Pattern	50¢/50¢/10¢	Gaston's Silver Compound	30¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Common Lever	50¢/50¢/40¢/50¢
Turner & Seymour Mfg. Co.	50¢	Pekes, Animal—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Morrill's No. 1, \$15.00; No. 3, \$24.00	40¢/10¢/50¢
Nuts—		Bishop's I. X. L.	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Leach's, No. 0, \$8.00; No. 1, \$15.00; No. 2, \$20.00	40¢/10¢/50¢
Nuts, off list Jan. 1, 1888: Square, Hex.		Bishop's O. K.	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Nash's	20¢/10¢/20¢/10¢/10¢
Hot Pressed	5.4¢ 5.9¢	Bishop's P. K.	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Hammer, Hotchkiss	50¢/50¢/10¢
Cold Punched	5.4¢ 5.9¢	Bishop's American	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Hammer, Bemis & Call Co.'s new Pat.	50¢/50¢
In lots less than 100 lb. 5¢, add 1/4¢; 1-b boxes, add 1¢ to list.		Peppers, Corn—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Bemis & Call Co.'s Lever and Spring Hammer	50¢/50¢
Oakum—		Round or Square, 1 qt.	50¢/12.00¢/15.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Bemis & Call Co.'s Plate	10¢
Government	7¢/7¢/28¢	Round or Square, 2 qt.	50¢/25.00¢/25.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Bemis & Call Co.'s Cross Cut	12¢/4¢
U. S. Navy	5¢/5¢/7¢	Post Hole and Tree Augers		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Alken's Genuine	12.00, 50¢/10¢
Navy	5¢/5¢/7¢	Samson Post Hole Digger	50¢/50¢/30¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Alken's Imitation	50¢/50¢/50¢
Oilers—		Fletcher Post Hole Augers	50¢/50¢/30¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Hart's Pat. Lever	50¢/50¢/20¢
Zinc and Tin	50¢/50¢/10¢	Eureka Diggers	50¢/50¢/17.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Disston's Star, \$9.00; No. 15, \$5.50; No. 2, \$10.00	10¢/20¢/10¢/10¢
Brass and Copper	50¢/10¢/50¢/10¢/50¢	Leed's	50¢/50¢/9.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Atkin's Lever	50¢/50¢/10¢/10¢
Malleable, Hammers, Improved, No. 1, \$3.50; No. 2, \$4.00; No. 3, \$4.40	10¢/10¢/10¢	Vaughan's Post Hole Auger	50¢/50¢/14.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Atkin's Criterion	50¢/50¢/7.50
Malleable, Hammers, Old Pattern, same list	40¢	Kohler's Little Giant	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00	40¢/10¢
Prior's Pat. or "Paragon" Zinc	40¢	Kohler's Hercules	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Avery's Saw Set and Punch	50¢/50¢
Prior's Pat. or "Paragon" Brass	50¢/50¢/10¢	Kohler's New Champion	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Am. Tool Co.'s Superior	50¢/50¢/15.50¢
Olmstead's Tin and Zinc	50¢	Schneider	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Saw Tools—	
Olmstead's Brass and Copper	50¢	Ryan's Post Hole Diggers	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Atkin's Perfection, \$15.00; Excelsior, \$6.00	50¢/50¢
Broughton's Zinc	50¢	Cronk's Post Bars	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Scale	
Broughton's Brass	50¢	Gibbs Post Hole Digger	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Hatch, Counter, No. 171, good quality	50¢/50¢
Packing, Steam—		Imperial	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Hatch, Tea, No. 161	50¢/50¢/7.00
Rubber		Petate Parers—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Union Platform, Plain	50¢/50¢/2.30
Standard	50¢/10¢/50¢/10¢/10¢	White Mountain	50¢/50¢/5.50	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Union Platform, Striped	50¢/50¢/2.30
Extra	50¢/10¢/50¢/10¢/10¢	Antrim Combination	50¢/50¢/5.50	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Chatillon's Grocers' Trip Scales	50¢/50¢
N. Y. B. & P. Co., Standard	50¢/10¢/50¢/10¢/10¢	Hoosier	50¢/50¢/13.50	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Chatillon's Eureka	50¢/50¢
N. Y. B. & P. Co., Empire	70¢	Pruning Hooks and Shears—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Chatillon's Favorite	50¢/50¢
N. Y. B. & P. Co., Salamander	70¢	Disston's Combined Pruning Hook and Saw	50¢/50¢/18.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Family, Turnbells	50¢/50¢/10¢
Jenkins' Standard	50¢/50¢/30¢	Disston's Pruning Hook	50¢/50¢/13.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Riehle Bros.' Platform	40¢
Miscellaneous—		E. S. Lee & Co.'s Pruning Tools	40¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Scale Beams—	
American Packing	10¢/11¢/5¢	Henry's Pat. Pat.	50¢/50¢/40¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Scale Beams, list Jan. 12, '82	50¢/10¢
Russia Packing	14¢/5¢	Henry's Pruning Shears	50¢/50¢/40¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Chatillon's No. 1	50¢/10¢/50¢
Italian Packing	13¢/14¢/5¢	Wheeler, M. & C. Co.'s Combination	50¢/50¢/12.00	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Chatillon's No. 2	50¢/10¢/50¢
Cotton Packing	15¢/17¢/5¢	Dunlap's Saw and Chisel	50¢/50¢/8.50	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Scrapers—	
Jute	7¢/8¢/5¢	J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	50¢/50¢/7.25	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Adjustable Box Scraper (S. R. & L. Co.)	50¢/50¢/10¢
Padlocks—		Palettes—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Box, 1 Handle	50¢/50¢/10¢
See Locks.		Hot House, Awning, &c.	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Box, 2 Handle	50¢/50¢/10¢
Pails—		Japanned Screw	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Dedance Box and Ship	50¢/50¢/10¢
Galvanized Iron—		Brass Screw	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Ship, Common	50¢/50¢/10¢
Quarts	10 12 14	Japanned Side	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Ship, R. I. Tool Co.	50¢/50¢/10¢
Hill's Light Weight	50¢/50¢/3.25	Japanned Clothes Line	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Screen Window and Door	
Hill's Heavy Weight	50¢/50¢/3.25	Empire Sash Pulley	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Frames—	
Whiting's	2.75 3.00 3.25	Moore's Sash, Anti-Friction	50¢/10¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Porter's Pat. Window and Door Frame	50¢/50¢/10¢
Sidney Shephard & Co.	2.80 3.00 3.40	Hay Fork, Solid Eye	50¢/10¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Warner's Screen Corner Irons	50¢/50¢/10¢
Iron Clad	2.75 3.00 3.25	Hay Fork, "Anti-Friction" 5 in. Solid	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Stearns' Frames and Corners	50¢/50¢/10¢
Fire Buckets	2.75 3.25 3.50	Hay Fork, "F" Common and Pat.	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Screw Drivers—	
Buckets, see Well Buckets.		Hay Fork, Tarbox Pat. Iron	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Douglas Mfg. Co.	50¢/10¢/10¢
Indurated Fibre Ware—		Hay Fork, Reed's Self-Lubricating	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Disston's	50¢/10¢/10¢
Star Pails, 12 qt.	50¢/50¢/4.50	Shade Block	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Disston's Pat. Excelsior	50¢/10¢/10¢
Fire, Stable and Milk, 14 qt.	50¢/50¢/5.85	Tackle Blocks	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Buck Bros.	50¢/10¢/10¢
Pencils—		Moore's Anti-Friction 5 in. Wheel	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Stanley R. & L. Co.'s	50¢/10¢/10¢
Faber's Carpenters'	high list 50¢	Pumps—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Varished Handles	50¢/10¢/10¢
Faber's Round Gilt	50¢/50¢/50¢	Cistern, Best Makers	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Black Handles	50¢/10¢/10¢
Dixon's Lead	50¢/50¢/50¢	Pitcher Spout, Best Makers	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Sargent & Co.'s	50¢/10¢/10¢
Dixon's Lumber	50¢/50¢/50¢	Pitcher Spout, Cheaper Goods	50¢/10¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	No. 1 Forged Blade	50¢/10¢/10¢
Dixon's Carpenters'	50¢/50¢/10¢	Punches—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Nos. 20, 30 and 60	50¢/10¢/10¢
Picks—		Saddlers' or Drive, good	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Knapp & Cowles' No. 1	50¢/10¢/10¢
Railroad or Adse Eye, 5 to 6, \$12.00; 6 to 7, \$13.00	50¢/50¢/10¢	Bemis & Call Co.'s Cast Steel Drive	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	No. 1 Extra	50¢/10¢/10¢
Picture Nails—		Bemis & Call Co.'s Springfield Drivet	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Nos. 00 & 4	50¢/10¢/10¢
Brass Head, Sargent's list	50¢/10¢/10¢	Spring, good quality	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Stearns'	50¢/10¢/10¢
Brass Head, Combination list	50¢/10¢/10¢	Spring, Leach's Pat.	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Gay & Parsons	50¢/10¢/10¢
Porcelain Head, Sargent's list	50¢/10¢/10¢	Bemis & Call Co.'s Spring and Check	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Champion	50¢/10¢/10¢
Porcelain Head, Combination list	50¢/10¢/10¢	Tinners' Hollow Punches	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Clark's Pat.	50¢/10¢/10¢
Niles' Patent	40¢	Avery's Revolving	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Crawford's Adjustable	50¢/10¢/10¢
Pinking Irons—		Avery's Saw-Set and Punch. See Saw Sets.	50¢/50¢/50¢	Manila, 1/4 in. and 5/16 in.	15¢/15¢	Elrich's Socket and Ratchet	50¢/10¢/10¢
Pipe, Wrought Iron—		Rail—		Manila, 1/4 in. and 5/16 in.	15¢/15¢	Albion's Spiral, new list	50¢/10¢/10¢



<b>Machings—</b>	
Flat Head, Iron.....	58¢
Round Head, Iron.....	50¢
<b>Bench and Hand—</b>	
Bench, Iron.....	55¢10¢55¢10¢10¢
Bench, Wood, Beech.....	50¢10¢
Bench, Wood, Hickory.....	50¢10¢
Hand, Wood.....	25¢10¢25¢10¢5¢
Lag, Blunt Point.....	75¢75¢10¢
Coch and Lag, Gimlet Point.....	75¢
Bed.....	25¢5¢
Hand Rail, Sargent's.....	60¢10¢
Hand Rail, H. & B. Mfg. Co.....	70¢10¢
Hand Rail, Am. Screw Co.....	75¢
Jack Screws, Millers Falls list.....	50¢50¢5¢
Jack Screws, P. S. & W.....	35¢
Jack Screws, Sargent's.....	60¢10¢60¢10¢5¢
Jack Screws, Stearns.....	40¢40¢10¢
<b>Scroll Saws—</b>	
Lester, complete, \$10.00.....	25¢
Rogers, complete, \$4.00.....	25¢
Barnes' Builders' and Cabinet Makers', \$15.....	25¢
Barnes' Scroll Saw Blades.....	35¢
<b>Scythe Snaths.....</b>	
50¢25¢	
<b>Shears—</b>	
American (Cast) Iron.....	75¢10¢75¢10¢5¢
Pruning..... See Pruning Hooks and Shears	
Barnard's Lamp Trimmers.....	50¢50¢10¢
Timmers.....	20¢25¢
Seymour's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5¢
Heinrich's Tailor's Shears.....	33¢4¢
First quality C. S. Trimmers.....	50¢50¢10¢
Second quality C. S. Trimmers.....	50¢10¢50¢10¢10¢
Acme Cast Shears.....	10¢10¢
Diamond Cast Shears.....	10¢
Clippers.....	10¢10¢
Victor Cast Shears.....	75¢10¢75¢10¢5¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢
Chicago Drop Forge & F. Co., Solid Steel Forged.....	60¢
Clausen Shear Co., Japanned.....	70¢
Clausen Shear Co., Nickleled, same list.....	60¢
<b>Sheaves—</b>	
<b>Sliding Door—</b>	
M. W. Co., list July, 1888.....	50¢10¢60¢5¢
R. & E., list Dec. 18, 1885.....	55¢30¢
Corbin's list.....	60¢10¢5¢
Patent Roller.....	60¢10¢5¢
Patent Roller, Hatfield's.....	75¢
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢25¢
Moore's Anti-Friction.....	50¢
<b>Sliding Shutter—</b>	
R. & E., list Dec. 18, 1885.....	60¢10¢25¢
Sargent's list.....	60¢10¢
Reading list.....	60¢10¢10¢
<b>Ship Tools—</b>	
L. & I. J. White.....	30¢5¢
Albertson Mfg. Co.....	25¢
<b>See, Horse, Mule, &amp;c.—</b>	
<b>Horse—</b>	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
<b>Mule—</b>	
Add \$1 per keg to above prices.	
<b>Ox, Wrought—</b>	
Ton lots.....	5¢ 9¢
1000 lb lots.....	5¢ 9¢
500 lb lots.....	5¢ 10¢
<b>Shot—</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 5 bag, 25 lb.....	\$1.16
Drop, 5 bag, 5 lb.....	.30
Buck and Chilled, 5 25 lb bag.....	1.41
Buck and Chilled, 5 5 lb bag.....	.34
<b>Shovels and Spades—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢
Norr.—Jobbers frequently give 5¢ off.....	75¢
Griffith's Black Iron.....	50¢10¢
Griffith's S. S. C. S. R. R. Goods.....	60¢60¢10¢
Griffith's Solid C. S. R. R. Goods.....	30¢
Old Colony (Sanford Fork & Tool Co.) 20¢	
St. Louis Shovel Co.....	30¢20¢75¢
Hussey, Binns & Co.....	15¢25¢
Hubbard & Co.....	20¢20¢75¢
Lehigh Mfg. Co.....	50¢10¢
Payne Pettibone & Son, list January, 1886.....	30¢
Remington's (Lowman's Pat.) 30¢10¢40¢	
Rowland's, Black Iron.....	50¢10¢
Rowland's Steel.....	60¢5¢60¢10¢
<b>Shovels and Tongs—</b>	
Iron Head.....	60¢10¢60¢10¢5¢
Brass Head.....	60¢10¢10¢
<b>Skeins, Thimble—</b>	
Western list.....	75¢5¢75¢10¢
Columbus Wrt. Steel, list Nov. 1, 1887.....	30¢
Coldbrookdale Iron Co.....	50¢10¢
Utica P. S. T. Skeins.....	60¢
Utica Turned and Fitted.....	35¢
<b>Sieves—</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10¢
Shaker (Barler's Pat.) Flour Sifters.....	5¢ doz \$2.00
Electric.....	5¢ doz \$18.00
Hunter's.....	5¢ doz \$21.00
Smith's Adjustable Sifters.....	5¢ doz \$2.00
Smith's Adjustable Milk Strainer.....	5¢ doz \$2.00
Smith's Adjustable T. & C. Strainer.....	5¢ doz \$1.25
<b>Sieves, Wooden Rim—</b>	
Mesh 18, Nested, 5 doz.....	70¢ 90¢
Mesh 20, Nested, 5 doz.....	85¢ \$1.00
Mesh 24, Nested, 5 doz.....	\$1.00 1.10
<b>Slides—</b>	
School, by case.....	40¢
<b>Snaps, Harness, &amp;c.—</b>	
Anchor (T. & S. Mfg. Co.).....	85¢
Fitch's (Bristol).....	50¢10¢
Hotchkiss.....	10¢
Andrews.....	50¢
Sargent's Patent Guarded.....	70¢10¢10¢
German, new list.....	40¢10¢
Covert.....	50¢25¢
Covert, New Patent.....	50¢25¢
Covert, New R. E.....	60¢25¢
Covered Spring.....	60¢10¢10¢
<b>Soldering Irons—</b>	
Covert's Adjustable, list Jan. 1, 1888.....	35¢25¢
<b>Speke Shaves—</b>	
Iron.....	45¢
Wood.....	30¢
Bailey's (Stanley R. & L. Co.).....	40¢10¢
Stearns.....	30¢10¢30¢
<b>Speke Trimmers—</b>	
Bonney's.....	5¢ doz \$10.00, 50¢
Stearns.....	20¢10¢
Ives, No. 1, \$15.00; No. 2, \$12.00 5¢ doz.....	55¢10¢
Douglas.....	5¢ doz \$9.00, 30¢
<b>Speens and Forks—</b>	
<b>Tinned Iron—</b>	
Basting, Cen. Stamp. Co.'s list.....	70¢10¢
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10¢
Buffalo S. S. & Co.....	38¢4¢2¢
Stover-Plated (4 mos. or 5¢ cash 30 days).....	50¢
Meriden Brit. Co., Rogers.....	50¢
C. Rogers & Bros.....	50¢
Rogers & Bro.....	50¢
Reed & Barton.....	50¢
Wm. Rogers Mfg. Co.....	50¢10¢60¢
Simpson, Hall, Miller & Co.....	50¢10¢
Holmes & Edwards Silver Co.....	50¢10¢60¢
L. Boardman & Son.....	50¢10¢
<b>Miscellaneous</b>	
Holmes & Edwards Silver Co.: No. 67 Mexican Silver.....	50¢10¢
No. 30 Silver Metal.....	50¢10¢
No. 24 German Silver.....	50¢10¢
No. 55 Nickel Silver.....	50¢
No. 49 Nickel Silver.....	50¢10¢
German Silver.....	50¢50¢5¢
German Silver, Hall & Elton.....	50¢5¢ cash
Nickel Silver.....	50¢5¢50¢10¢5¢ cash
Britannia.....	90¢
Boardman's Nickel Silver.....	50¢
Boardman's Britannia Spoons, case 10 lots.....	60¢
<b>Springs—</b>	
Elliptic, Concord, Platform and Half Scroll.....	60¢60¢25¢
Cliff's Bolster Springs.....	25¢
<b>Squares—</b>	
Steel and Iron.....	75¢10¢80¢
Nickel Plated.....	60¢10¢60¢10¢
Try Square and T Bevels.....	10¢
Diston's Try Square and T Bevels.....	45¢10¢
Winterbottom's Try and Miter.....	30¢10¢
Starrett's Micrometer Caliper Squares.....	25¢
Avery's Flush Bevel Squares.....	40¢
Avery's Bevel Protractor.....	50¢
<b>Staples—</b>	
Fence Staples, Galvanized.....	Same price as P. B. Wire.
Fence Staples, Plain.....	See Trl. Rep.
<b>Steelyards.....</b>	
40¢10¢50¢	
<b>Stocks and Dies—</b>	
Blacksmith's.....	30¢5¢30¢10¢
Waterford Goods.....	30¢5¢30¢10¢
Butterfield's Goods.....	30¢5¢30¢10¢
Lightning Screw Plate.....	25¢30¢
Reece's New Screw Plates.....	35¢45¢40¢
<b>Stone—</b>	
Hindustan No. 1, 3¢; Axe, 3¢; Slips No. 1, 4¢.....	
Sand Stone.....	5¢ 9¢
Washita Stone, Extra.....	15¢20¢
Washita Stone, No. 1.....	14¢15¢
Washita Stone, No. 2.....	10¢11¢
Washita Stone, No. 1, Extra.....	38¢38¢
Washita Slips, No. 1.....	24¢25¢
Arkansas Stone, No. 1, 4 to 6 in.....	\$1.50
Arkansas Stone, No. 1, 8 to 9 in.....	\$1.85
Turkey Oil Stone, 4 to 8 in.....	40¢
Turkey Slips.....	\$1.00, \$1.50
Lake Superior Chise.....	30¢
Lake Superior Slips, Chise.....	31¢32¢
Seneca Stone, Red Paper Brand.....	18¢20¢
Seneca Stone, High Rounds.....	20¢25¢
Seneca Stone, Small Whets.....	20¢24¢
<b>Steve Polish—</b>	
Joseph Dixon's.....	5¢ gro \$6.00, 10¢
Gem.....	5¢ gro \$4.50, 10¢
Gold Medal.....	5¢ gro \$6.00, 25¢
Mirror.....	5¢ pro \$6.00, —
Lustro.....	5¢ gro \$4.75
Ruby.....	5¢ gro \$2.75
Rising Sun, 5 gro lots.....	5¢ gro \$5.50
Dixon's Plumbago.....	5¢ 5¢
Boynton's Noon Day.....	15¢
Parlor Pride Stove Enamel.....	5¢ gro 3 cans
Yates' Liquid.....	3 5 10 gal..... 8¢
Yates Standard Paste Polish, 10 lb cans.....	50¢ 50 70 80
Jet Black.....	5¢ gro \$3.50
Japanese.....	5¢ gro \$3.50
Pearl.....	5¢ gro \$2.50
Diamond O. K. Enamel.....	5¢ gro \$12.00
Bonnett's Liquid Stove Polish.....	5¢ gro \$9.00
Bonnett's Paste Stove Polish.....	5¢ gro \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12¢4¢
Black Jack Water Paste, 5 and 10 lb cans.....	12¢4¢
Nickel Plate Paste.....	5¢ gro \$6.00
<b>Tacks, Brads, &amp;c.—</b>	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named):	
American Iron Carpet.....	40¢80¢25¢
Steel Carpet.....	80¢80¢25¢
Swedes Iron Carpet.....	80¢80¢25¢
American Iron Cut.....	75¢75¢10¢
Swedes Iron.....	75¢75¢10¢
Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron.....	75¢10¢75¢10¢5¢
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10¢5¢
Gimp and Lace.....	75¢10¢75¢10¢5¢
Tinned Gimp and Lace.....	75¢10¢75¢10¢5¢
Swedes Iron Trimmers.....	75¢10¢75¢10¢5¢
Swedes Iron Miners.....	75¢10¢75¢10¢5¢
Swedes Iron Bill Posters.....	75¢10¢75¢10¢5¢
Swedes Steel (Swedes Iron price list).....	80¢80¢25¢
Copper Tacks.....	50¢10¢
Copper Finishing, Trunk and Clout Nails.....	50¢10¢
Finishing Nails.....	70¢10¢70¢10¢10¢
Trunk and Clout Nails.....	70¢10¢70¢10¢10¢
Tinned Trunk and Clout Nails.....	70¢10¢
Basket Nails.....	70¢10¢70¢10¢10¢
<b>Common and Patent Brads, 70¢10¢70¢</b>	
<b>Hungarian Nails.....</b>	
Chair Nails.....	70¢10¢70¢10¢10¢
Zinc Glaziers' Points.....	50¢50¢5¢
Cigar Box Nails.....	50¢10¢50¢10¢5¢
Picture-Frame Points.....	50¢10¢50¢10¢5¢
Looking-Glass Tacks.....	50¢10¢50¢10¢5¢
Leathered Carpet.....	50¢10¢50¢10¢5¢
Brush Tacks.....	50¢10¢50¢10¢5¢
Shoe Finders, List Jan. 2, 1888.....	10¢10¢
<b>Lining and Saddle Nails, List Jan. 1, 1888:</b>	
Silvered.....	30¢10¢10¢
Japanned.....	30¢10¢10¢
Double-Pointed Tacks.....	85¢
Wire Carpet Nails.....	50¢10¢
Wire Brads & Nails, see Nails, Wire	
Steel Wire Brads, R. & E. Mfg. Co.'s list.....	50¢10¢
<b>Tap Borers—</b>	
Common and Kind.....	20¢10¢
Tap Borers.....	20¢10¢
Enterprise Mfg. Co.....	20¢10¢30¢
Clark's.....	35¢45¢
<b>Tapes, Measuring—</b>	
American.....	25¢10¢
Spring.....	40¢
Chesterman's, Regular list.....	25¢30¢
<b>Thermometers—</b>	
Tin Case.....	80¢80¢10¢
<b>Thimble Skeins—See Skeins.</b>	
<b>Ties, Bale—Steel</b>	
Standard Wire, list.....	50¢10¢5¢
<b>Tinners' Shears, &amp;c.—</b>	
Shears and Snips (P. S. & W.).....	30¢25¢
Punches, see Punches.....	
Snips, J. Mallinson & Co.....	33¢4¢
<b>Tinware—</b>	
Stamped, Japanned and Plated, list Jan. 20 1887.....	75¢75¢5¢
<b>Tire Benders, Upsetters, &amp;c—</b>	
Stoddard's Lightning Tire Upsetters.....	15¢
Detroit Perfected Tire Bender.....	15¢
<b>Tobacco Cutters—</b>	
Champion.....	30¢10¢30¢
Wood Bottom.....	5¢ doz \$5.00, \$5.25
All Iron.....	5¢ doz \$4.25
Nashua Lock Co.'s.....	5¢ doz \$18.00, 50¢55¢
Wilson's.....	55¢
Sargent's.....	5¢ doz \$24, 55¢10¢
Acme.....	5¢ doz \$30.00, 40¢
<b>Transom Lifters—</b>	
Wollensak's: Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	25¢
Skylight Lifters.....	85¢
Crown, Eagle and Shield.....	50¢
Rether's, list Jan. 1, 1887.....	50¢
Bronzed Iron Rods.....	50¢10¢2
Brass, Real Bronze or Nickel Plate.....	30¢
Excelsior.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's Universal.....	40¢40¢10¢
<b>Traps—</b>	
<b>Game—</b>	
Newhouse.....	35¢40¢5¢
Oneda Pattern.....	70¢70¢5¢
Game, Blake's Patent.....	40¢10¢5¢
<b>Mouse and Rat—</b>	
Mouse Wood Choker.....	5¢ doz holes, 11¢12¢
Mouse, Round Wire.....	5¢ doz \$1.50, 10¢
Mouse, Cage, Wire.....	5¢ doz \$2.50, 10¢
Mouse, Catch-em-alive.....	5¢ doz \$2.50, 15¢
Mouse, "Bonanza".....	5¢ doz \$1.00
Mouse Delusion.....	5¢ doz \$1.00
Rat, "Decoy".....	5¢ gr \$10.00, 10¢
Ideal.....	5¢ gr \$10.00
Cyclone.....	5¢ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	5¢ doz 90¢
In full cases.....	5¢ doz 75¢
<b>Trowels—</b>	
Lothrop's Brick and Plastering.....	25¢
Reed's Brick and Plastering.....	15¢
Diston's Brk and Plastering.....	25¢25¢10¢
Pease's Plastering.....	50¢
Clement & Maynard's.....	50¢
Rose's Brick.....	15¢20¢
Brade's Brick.....	25¢
Worrall's Brick and Plastering.....	20¢
Garden.....	70¢
<b>Triers—</b>	
Butter and cheese.....	25¢
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co.'s list, '82.....	40¢
<b>Tubes, Boiler—</b>	
See Pipe.....	
<b>Twine—</b>	
Flax Twine.....	BC. B.
No. 9, 4 and 1/2 B Balls.....	22¢ 30¢
No. 12, 4 and 1/2 B Balls.....	21¢ 25¢
No. 18, 4 and 1/2 B Balls.....	18¢ 25¢
No. 24, 4 and 1/2 B Balls.....	18¢ 25¢
No. 30, 4 and 1/2 B Balls.....	16¢ 27¢
No. 204, Matras, 4 and 1/2 B Balls.....	48¢50¢
Chalk Line, Cotton, 1/4 B Balls.....	25¢
Mason Line, Linen, 1/4 B Balls.....	55¢
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11¢12¢
3-Ply Hemp, 1 1/2 B Balls.....	12¢13¢
3-Ply Hemp, 1 1/4 B Balls.....	11¢11¢
Cotton Wrapping, 1/4 B Balls to 1.6¢.....	16¢
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10¢
Wool.....	6¢4¢6¢
Paper.....	13¢14¢
Cotton Mops, 6, 9, 12 and 15 B to doz.....	18¢
<b>Vises—</b>	
Solid Box.....	60¢60¢5¢
Parallel.....	
Fisher & Norris Double Screw.....	15¢10¢
Stephens.....	25¢30¢
<b>Parker's.....</b>	
20¢25¢	
Wilson's.....	55¢
Howard's.....	40¢
Bonney's.....	40¢10¢
Millers Falls.....	40¢40¢10¢
Trenton.....	40¢5¢40¢10¢
Merrill's.....	15¢30¢
Sargent's.....	60¢10¢10¢
Backus and Union.....	40¢
Double Screw Leg.....	15¢15

# CURRENT METAL PRICES.

JUNE 5, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	
Bar Iron from Store.	
Common Iron:	
3/4 to 2 in. round and square.	\$ 1.90 @ ..
1 to 6 in. x 1/2 to 1 in.	\$ 2.00 @ 2.10
Refined Iron:	
3/4 to 2 in. round and square.	\$ 2.20 @ 2.30
1 to 4 in. x 1/2 to 1 in.	\$ 2.30 @ 2.40
4 1/2 to 6 in. x 1/2 to 1 in.	\$ 2.40 @ 2.50
1 to 6 in. x 1/2 and 5-16	\$ 2.50 @ 2.60
Rods—3/4 and 1-1/2 round and sq.	\$ 2.10 @ 2.20
Bands—1 to 6 x 8-16 to No. 12.	\$ 2.20 @ 2.30
"Burden Best" Iron, base price.	\$ 3.00 @ ..
Burden's "H. B. & S." Iron, base price.	\$ 3.80 @ ..
"Ulster"	\$ 3.00 @ ..
Norway Rods	4.00 @ 5.00

Merchant Steel from Store.	
Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/2
Best Cast Steel, base price in small lots.	5
Best Cast Steel Machinery, base price in small lots.	5 1/2

Sheet Iron from Store.	
Common American.	R. G. Cleaned.
10 to 16.	\$ 2.75 @ 2.80
17 to 20.	\$ 2.85 @ 3.00
21 to 24.	\$ 3.00 @ 3.10
25 and 26.	\$ 3.20 @ 3.30
27.	\$ 3.35 @ 3.45
28.	\$ 3.50 @ 3.60
Galv'd, 14 to 20.	\$ 4.50 @ 4.60
Galv'd, 21 to 24.	\$ 4.75 @ 4.85
Galv'd, 25 to 26.	\$ 5.25 @ 5.35
Galv'd, 27.	\$ 5.45 @ 5.55
Galv'd, 28.	\$ 5.60 @ 5.70
Patent Planished.	\$ 10 1/2 @ 10 3/4
Russia.	\$ 10 1/2 @ 10 3/4
American Cold Rolled B. B.	\$ 5 1/2 @ 5 3/4

English Steel from Store.	
Best Cast.	\$ 15 @ 16
Extra Cast.	\$ 16 1/2 @ 17
Swaged, Cast.	\$ 16 @ 17
Best Double Shear.	\$ 15 @ 16
Blister, 1st quality.	\$ 12 @ 13
German Steel, Best.	\$ 10 @ 11
2d quality.	\$ 9 @ 10
3d quality.	\$ 8 @ 9
Sheet Cast Steel, 1st quality.	\$ 15 @ 16
2d quality.	\$ 14 @ 15
3d quality.	\$ 13 @ 14

METALS.	
Tin.	
Banca, Pigs.	\$ 23 @ 24
Straits, Pigs.	\$ 22 @ 23
English, Pigs.	\$ 23 1/2 @ 24
Straits in Bars.	\$ 24 @ 25

Tin Plates.	
Charcoal Plates.—Bright.	
Melvin Grade.	\$ 5.75 @ 5.80
IC, 10 x 14.	\$ 5.75 @ 5.80
IC, 12 x 12.	\$ 5.75 @ 5.80
IC, 14 x 20.	\$ 5.75 @ 5.80
IC, 20 x 28.	\$ 5.75 @ 5.80
IX, 10 x 14.	\$ 7.25 @ 7.50
IX, 12 x 12.	\$ 7.50 @ 7.75
IX, 14 x 20.	\$ 7.25 @ 7.50
IX, 20 x 28.	\$ 15.00 @ 15.50
DC, 12 1/2 x 17.	\$ 5.50 @ 5.75
DC, 12 1/2 x 17.	\$ 7.00 @ 7.25
Call and Grade.	\$ 5.75 @ 6.00
IC, 10 x 14.	\$ 5.75 @ 6.00
IC, 12 x 12.	\$ 5.75 @ 6.00
IC, 14 x 20.	\$ 5.75 @ 6.00
IX, 10 x 14.	\$ 7.25 @ 7.50
IX, 12 x 12.	\$ 7.50 @ 7.75
IX, 14 x 20.	\$ 7.25 @ 7.50
IX, 20 x 28.	\$ 12.00 @ 12.50
DC, 12 1/2 x 17.	\$ 4.75 @ 5.00
DX, 12 1/2 x 17.	\$ 5.75 @ 6.00

Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20.	\$ 4.75 @ 5.00
10 x 20.	\$ 7.25 @ 7.50
20 x 28.	\$ 9.75 @ 10.25
IX, 10 x 14, 14 x 20.	\$ 4.40 @ 4.60
Charcoal Plates.—Tern.	
Dean Grade.—IC, 14 x 20.	\$ 4.35 @ 4.62 1/2
20 x 28.	\$ 8.75 @ 9.25
IX, 14 x 20.	\$ 5.40 @ 5.62 1/2
20 x 28.	\$ 11.00 @ 11.37 1/2
Abecarne Grade.—IC, 14 x 20.	
20 x 28.	\$ 4.25 @ 4.50
IX, 14 x 20.	\$ 5.25 @ 5.50
20 x 28.	\$ 10.50 @ 10.80

Tin Boiler Plates.	
IX, 14 x 26.	112 sheets @ \$12.75
IX, 14 x 28.	112 sheets @ 12.75
IX, 14 x 31.	112 sheets @ 14.25

Copper.	
Duty: Pig, Bar and Ingot, 4¢: Old Copper, 3¢	
Manufactured (including all articles of which Copper is a component of chief value), 4¢ s. ad valorem.	
Ingot.	
"Lake"	@ 13 1/2
"Anchor" Brand.	@ 12 1/2

Sheet and Bolt.  
Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

		Weights per square foot and prices per pound.			
Not wider than	Not longer than	Over 64 oz.	32 to 64 oz.	16 to 32 oz.	8 oz.
30	72	30	30	31	32
32	72	30	30	32	33
34	96	30	30	33	34
36	96	30	30	34	35
38	96	30	30	35	36
40	96	30	30	36	37
42	96	30	30	37	38
44	96	30	30	38	39
46	96	30	30	39	40
48	96	30	30	40	41
50	96	30	30	41	42
52	96	30	30	42	43
54	96	30	30	43	44
56	96	30	30	44	45
58	96	30	30	45	46
60	96	30	30	46	47
62	96	30	30	47	48
64	96	30	30	48	49
66	96	30	30	49	50
68	96	30	30	50	51
70	96	30	30	51	52
72	96	30	30	52	53
74	96	30	30	53	54
76	96	30	30	54	55
78	96	30	30	55	56
80	96	30	30	56	57
82	96	30	30	57	58
84	96	30	30	58	59
86	96	30	30	59	60
88	96	30	30	60	61
90	96	30	30	61	62
92	96	30	30	62	63
94	96	30	30	63	64
96	96	30	30	64	65
98	96	30	30	65	66
100	96	30	30	66	67
102	96	30	30	67	68
104	96	30	30	68	69
106	96	30	30	69	70
108	96	30	30	70	71
110	96	30	30	71	72
112	96	30	30	72	73
114	96	30	30	73	74
116	96	30	30	74	75
118	96	30	30	75	76
120	96	30	30	76	77
122	96	30	30	77	78
124	96	30	30	78	79
126	96	30	30	79	80
128	96	30	30	80	81
130	96	30	30	81	82
132	96	30	30	82	83
134	96	30	30	83	84
136	96	30	30	84	85
138	96	30	30	85	86
140	96	30	30	86	87
142	96	30	30	87	88
144	96	30	30	88	89
146	96	30	30	89	90
148	96	30	30	90	91
150	96	30	30	91	92
152	96	30	30	92	93
154	96	30	30	93	94
156	96	30	30	94	95
158	96	30	30	95	96
160	96	30	30	96	97
162	96	30	30	97	98
164	96	30	30	98	99
166	96	30	30	99	100
168	96	30	30	100	101
170	96	30	30	101	102
172	96	30	30	102	103
174	96	30	30	103	104
176	96	30	30	104	105
178	96	30	30	105	106
180	96	30	30	106	107
182	96	30	30	107	108
184	96	30	30	108	109
186	96	30	30	109	110
188	96	30	30	110	111
190	96	30	30	111	112
192	96	30	30	112	113
194	96	30	30	113	114
196	96	30	30	114	115
198	96	30	30	115	116
200	96	30	30	116	117
202	96	30	30	117	118
204	96	30	30	118	119
206	96	30	30	119	120
208	96	30	30	120	121
210	96	30	30	121	122
212	96	30	30	122	123
214	96	30	30	123	124
216	96	30	30	124	125
218	96	30	30	125	126
220	96	30	30	126	127
222	96	30	30	127	128
224	96	30	30	128	129
226	96	30	30	129	130
228	96	30	30	130	131
230	96	30	30	131	132
232	96	30	30	132	133
234	96	30	30	133	134
236	96	30	30	134	135
238	96	30	30	135	136
240	96	30	30	136	137
242	96	30	30	137	138
244	96	30	30	138	139
246	96	30	30	139	140
248	96	30	30	140	141
250	96	30	30	141	142
252	96	30	30	142	143
254	96	30	30	143	144
256	96	30	30	144	145
258	96	30	30	145	146
260	96	30	30	146	147
262	96	30	30	147	148
264	96	30	30	148	149
266	96	30	30	149	150
268	96	30	30	150	151
270	96	30	30	151	152
272	96	30	30	152	153
274	96	30	30	153	154
276	96	30	30	154	155
278	96	30	30	155	156
280	96	30	30	156	157
282	96	30	30	157	158
284	96	30	30	158	159
286	96	30	30	159	160
288	96	30	30	160	161
290	96	30	30	161	162
292	96	30	30	162	163
294	96	30	30	163	164
296	96	30	30	164	165
298	96	30	30	165	166
300	96	30	30	166	167
302	96	30	30	167	168
304	96	30	30	168	169
306	96	30	30	169	170
308	96	30	30	170	171
310	96	30	30	171	172
312	96	30	30	172	173
314	96	30	30	173	174
316	96	30	30	174	175
318	96	30	30	175	176
320	96	30	30	176	177
322	96	30	30	177	178
324	96	30	30	178	179
326	96	30	30	179	180
328	96	30	30	180	181
330	96	30	30	181	182
332	96	30	30	182	183
334	96	30	30	183	184
336	96	30	30	184	185
338	96	30	30	185	186
340	96	30	30	186	187
342	96	30	30	187	188
344	96	30	30	188	189
346	96	30	30	189	190
348	96	30	30	190	191
350	96	30	30	191	192
352	96	30	30	192	193
354	96	30	30	193	194
356	96	30	30	194	195
358	96	30	30	195	196
360	96	30	30	196	197
362	96	30	30	197	198
364	96	30	30	198	199
366	96	30	30	199	200
368	96	30	30	200	201
370	96	30	30	201	202
372	96	30	30	202	203
374	96	30	30	203	204
376	96	30	30	204	205
378	96	30	30	205	206
380	96	30	30	206	207
382	96	30	30	207	208
384	96	30	30	208	209
386	96	30	30	209	210
388	96	30	30	210	211
390	96	30	30	211	212
392	96	30	30	212	213
394	96	30	30	213	214
396	96	30	30	214	215
398	96	30	30	215	216
400	96	30	30	216	217
402	96	30	30	217	218
404	96	30	30	218	219
406	96	30	30	219	220
408	96	30	30	220	221
410	96	30	30	221	222
412	96	30	30	222	223
414	96	30	30	223	224
416	96	30	30	224	225
418	96	30	30	225	226
420	96	30	30	226	227
422	96	30	30	227	228
424	96	30	30	228	229
426	96	30	30	229	230
428	96	30	30	230	231
430	96	30	30	231	232
432	96	30	30	232	233
434	96	30	30	233	234
436	96	30	30	234	235
438	96	30	30	235	236
440	96	30	30	236	237
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536	96	30	30	284	285
538	96	3			

# THE IRON AGE

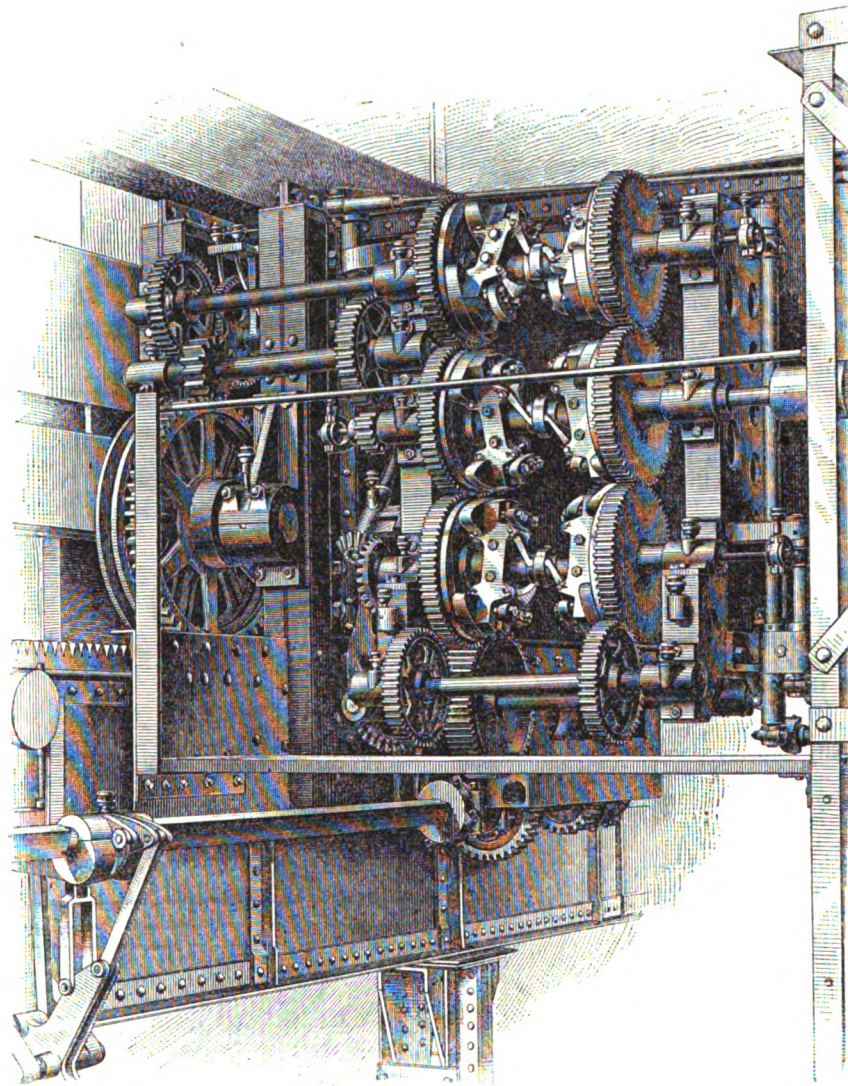
THURSDAY, JUNE 13, 1889.

## Power Traveling Crane.

The power traveling crane of which we herewith present engravings of the principal parts consists of two strong plate-girders securely connected at the ends and across the top, thus securing the necessary lateral strength required for high speeds of travel. It is carried at each end upon two large wheels with heavy steel tires and double flanges, and is moved and kept

driven by a square shaft parallel to the runway, which shaft is carried in improved drop-hangers supporting it in a securely locked capped bearing of ample length. The cap over the bearing is provided with oil and grease cups, insuring lubrication and protection from dirt. Power is transmitted through spur-gearing and improved friction-clutches of large size and ample power. Few bevel-wheels are used and no worm-wheels. All the movements of the

feet per minute, or one-half its capacity at 40 feet per minute. The load is raised and lowered by power and is at all times automatically sustained, no hand or foot brake being required. The machinery is all easily accessible, and full provision is made for easy lubrication. Brass oil-cups are furnished where needed. Power is transmitted to the trolley by square shafts in the bridge, which shafts are also carried in improved drop-hangers holding



*The Main Operating Gear.*

## THE SELLERS POWER TRAVELING CRANE.

square by means of spur-wheels engaging into cast-iron racks on each side of the runway. This feature of driving both sides of the bridge positively the makers of this crane found to be essential for safe and certain action at the high speeds of traverse used. The trolleys are carried entirely within the bridge, thus economizing height and enabling the greatest lift to be obtained with the greatest clearance under the bridge. The load on the trolley is sustained by four strands of chain so arranged as to lift always in a vertical line, with no tendency to deviate sideways—a very important feature for many purposes, as in a foundry for setting cores, drawing patterns, &c., and machine-erecting shops for assembling work, &c. The crane is

bridge with two trolleys are controlled by only eight levers, one for traversing the bridge, one to change the speed or entirely disconnect the machinery in the bridge from the main driving-shaft, which may run continuously; and three for the trolleys, one to change speeds, one to traverse and one to hoist and lower. In a bridge with only one trolley the same movements are controlled by five levers. These levers are conveniently operated from a hanging cage or platform, giving the operator full view of the entire space covered by the crane. Crane with 5-ton or larger trolleys will lift its maximum capacity at 10 feet per minute, or one-quarter its capacity at 40 feet per minute. Crane with 2½-ton trolley will lift its maximum capacity at 20

the shafts above and below and having long capped bearings to insure against wear. The crane has fast and slow gearing, giving the following maximum speeds, but variable at the will of the operator from maximum to zero :

Bridge travel, fast gear...200 feet per minute.  
Bridge travel, slow gear...100 feet per minute.  
Trolley travel, fast gear...100 feet per minute.  
Trolley travel, slow gear... 50 feet per minute.

An important feature is the fact that the change from fast to slow or slow to fast speeds requires no change in the speed of the main driving-shaft, but is accomplished in the crane itself by simply shifting a lever; consequently it is possible to use more than one crane on the same runway, each one entirely independent of the



other, and can be used slow or fast, at whatever speed the service may demand, without in any way interfering with or affecting the action or speed of the other crane or cranes that may be driven from the same shaft. Briefly stated, the prominent superior features of this crane, which is manufactured by Wm. Sellers & Co., Incorporated, of Philadelphia, Pa., are:

High speeds of traverse and hoist under perfect control and variable to the slowest speed that can possibly be required. Load automatically sustained at all times, thus avoiding absolutely the great danger and anxiety which are inseparable from the use of those cranes which require the operator to apply the brake. All movements are accomplished by very few levers. Capped and locked tumbler bearings thoroughly lubricated. All machinery easily accessible. Load raised or lowered always in a vertical line. Character of bridge giving great lateral strength and permitting maximum height of hoist and clearance under the bridge. Complete independence of each crane when two or more cranes are used on the same runway and driven from the same shaft.

#### Cupolas for Remelting Cast-Iron.

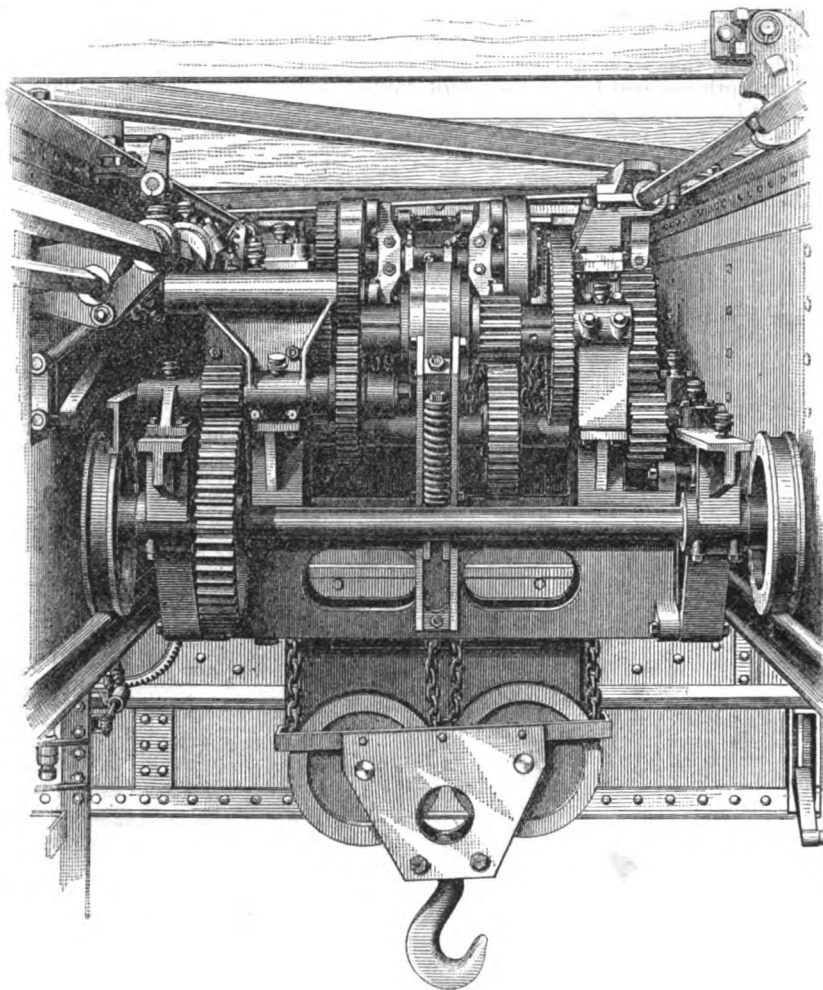
At a late convention of the Institution of Engineers Mr. Charles Hornung, of Middlesborough, England, read a paper upon the subject of cupolas adapted for remelting iron which is of sufficient interest to command the attention of many of our readers, and we therefore reprint it herewith:

During recent years many improvements have been made and patented with the object of reducing the cost of remelting iron in foundry cupolas, and have met with various degrees of success. The lining has been more carefully shaped according to the requirements of the furnace. In some cases hot blast has been used, and the waste gases have been carried away by flues for the purpose of heating either boilers or the metal to be charged into the furnace. The object of this paper is to give a short sketch of a few of these improvements, together with some of the results obtained. Originally cupolas were square, round, or oval in section, and provided with a single tuyere only, the lining being composed of a refractory sand rammed up around a metal core to the desired shape. But this lining was found to wear away very rapidly and required frequent repairs; hence it came about that the sand was gradually replaced by firebrick. The height of these cupolas was usually only about 6 feet, and the consumption of fuel reached as much as 10 cwt. per ton of metal melted. The capacity of these cupolas was found inadequate for all but the lightest work; so, in order to collect a larger quantity of iron in the crucible, or lower part of the furnace, five or six tuyeres were placed on either side of the cupola, one above the other, about 10 inches apart, and connected outside by vertical pipes, only one tuyere being used at a time. When the blast was turned on all the tuyere holes excepting the lowest one were closed; then as the melted metal in the crucible rose up to the level of this bottom tuyere it was stopped up and the next above it opened, and so on in rotation until the top tuyere was open and those beneath it all stopped up, after which the metal was tapped out in the ordinary way.

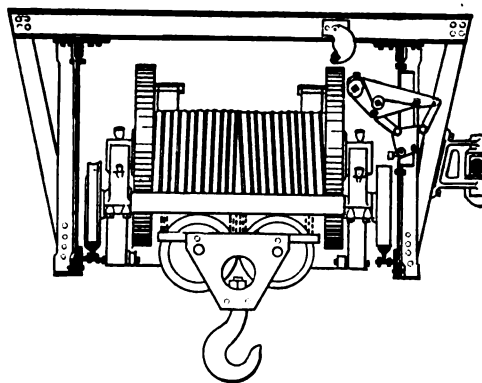
At one time cupolas were simply cylindrical in shape, the inside diameter of the lining being the same from top to bottom; but about the year 1860 Mr. Ireland patented a cupola, the lining of which was made smaller in diameter at the tuyeres. The superiority of the working of this furnace over those generally in use at that time was due to the more careful system of charging adopted and to the better proportioning of the internal shape. The

method of working as described by Ireland was as follows: After lighting up and heating the cupola by means of a small fire kindled in the usual way 7 cwt. of coke were charged, and on the top of this 1 ton of pig-iron, broken up into pieces about 10 inches long, next 2 cwt. of coke and 1 ton of iron, the subsequent charges being about 1½ cwt. of coke and 1 ton of pig-iron, ac-

said they ought to be. Owing to the gradual narrowing toward the tuyeres of the internal diameter of the Ireland furnace the charges obtained a regular descent, and owing to the combustion being concentrated in a smaller space for the same amount of coke burnt, the temperature immediately in front of the tuyeres was much higher than in the ordinary cupola



*Perspective View of Hoisting Gear.*



*Transverse Section through Trolley.*

according to the quantity of metal required. The cupola contained, when full up to charging level, about 6 tons of pig-iron and 15 cwt., or 12½ per cent., of coke. Undoubtedly Ireland effected very great improvement in the working of cupolas, and he deserves recognition for having been the first to give properly directed consideration to this important branch of the iron trade; but I have not been able to find that the results obtained in the actual working of his cupolas were quite as favorable in respect of coke consumption as he

with parallel sides. In order to allow of collecting and keeping a good supply of melted metal Ireland increased the diameter of the lower portion of his cupola, generally termed the crucible or well. The tuyeres were placed in two horizontal rows, 16 tuyeres of about 3 inches in diameter in the upper and four tuyeres of 8 inches in diameter in the lower row. This does not seem to have effected much economy, but only to have increased the melting zone.

The Stewart cupola, commonly known as Stewart's rapid cupola, is provided with



three rows of tuyeres close together, which produce an effect exactly similar to that just described. Further, the melting zone being increased, the metal has to pass through a greater space, where it is subjected to the oxidizing influences of the incoming blast. To some extent this oxidization of the molten metal is prevented by raising the hearth of the furnace up to within a few inches of the tuyeres, and having, in place of the well or crucible for the melted metal, a separate receiver connected to the cupola by means of a brick-lined spout from its hearth

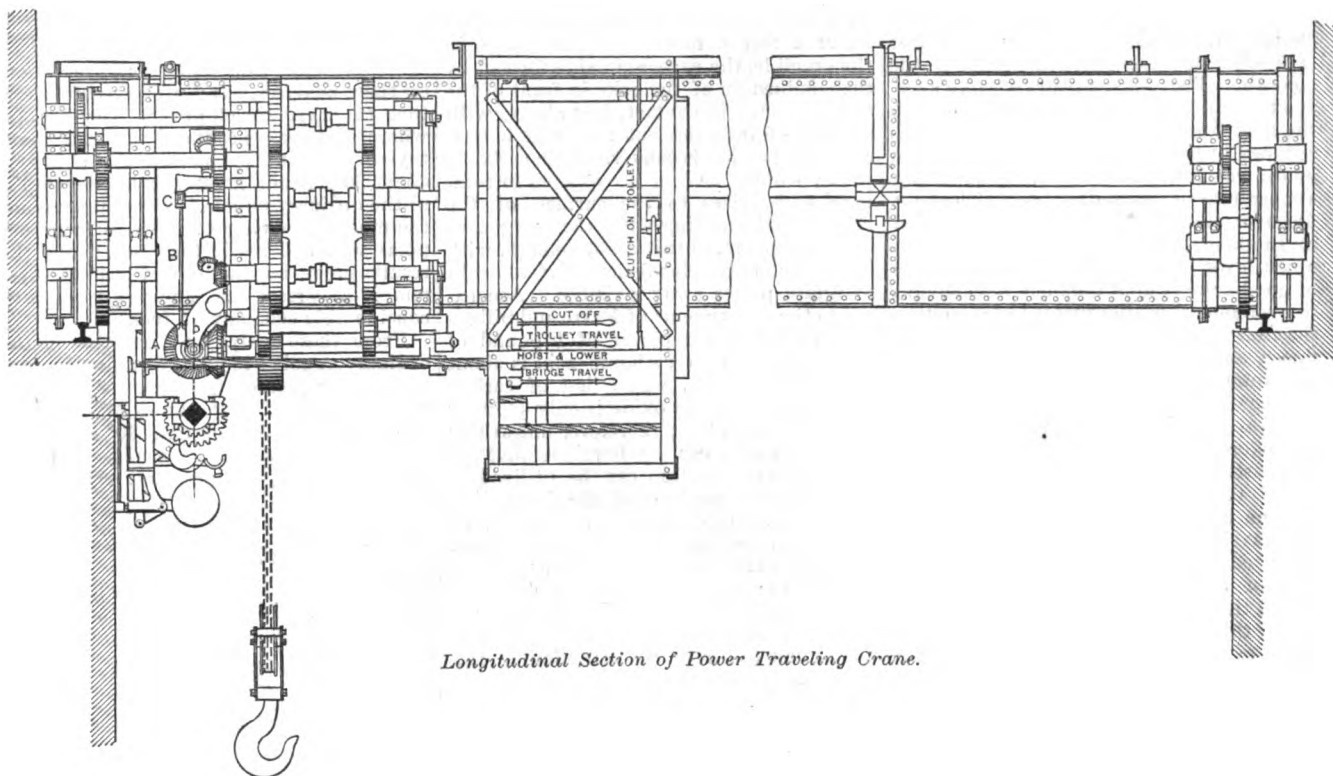
become clogged up with slag, and has to be cleaned out entirely every night, which is a great inconvenience in the case of working right through for two or three days with the same furnace. Otherwise the metal obtained is good and clean.

Heaton patented a cupola worked by means of the draft caused only by the height of the chimney and the ascensive power of hot air, instead of forced blast; but this method was slow and entirely unsuited for intermittent working.

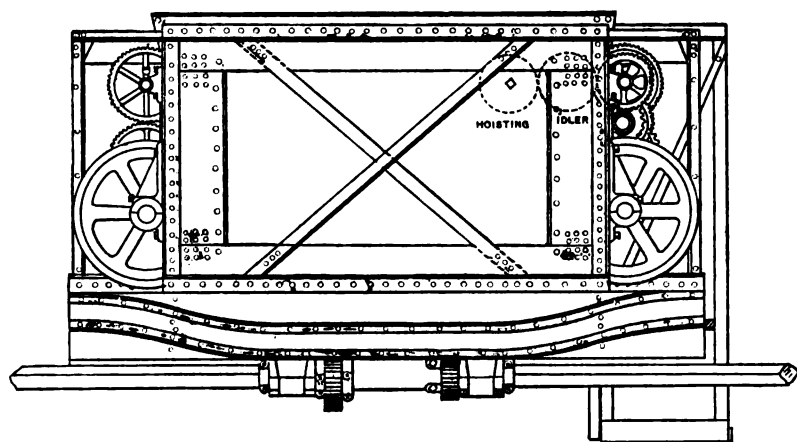
Woodward's cupola was worked by means of an induced current created by a

of an engine and fan, but it is doubtful if the actual results were as good as those given in some accounts; at all events, this system of working seems never to have come into general use. Then, again, the distribution of oxygen was irregular, and, consequently, the combustion was incomplete; the tuyeres were also too small.

Some of these difficulties appear to have been quite recently overcome in the Herbertz cupola, which, in the place of tuyeres, is provided with an annular opening so constructed that it can be varied in height as required according to the work-



Longitudinal Section of Power Traveling Crane.



Transverse Section.

level. This receiver is entirely lined out and roofed with fire-brick, and is provided with the necessary tapping and slagging holes. Leading off from the roof of the receiver to about the center of the charge in the cupola is a pipe, lined with fire-clay to about 2 inches diameter. This pipe carries away the heated gases from off the surface of the molten metal, and delivers them into the center of the descending charge, which is thereby partially heated before arriving at the melting zone. Owing to the depth from the hearth level being so very much smaller than in other cupolas, the coke for lighting up is considerably reduced. The difficulty of Stewart's arrangement, however, seems to be in the receiver itself. This is apt to

steam jet blowing up the chimney. There were two rows of rectangular tuyeres, or rather holes, for the admission of the air, usually eight in the upper and four in the lower range. The jet was a simple contracted nozzle, fixed in the center at the bottom of the chimney, about 4 feet above the charging level. The steam jet for creating the draft was said not to be greater than would be required for driving an engine and fan. Woodward claimed that the coke consumption in one of his cupolas for ordinary work was about 10 per cent. of the metal charged, including lighting up. The charge was introduced by means of a hopper at the side of the furnace. The first cost of such a cupola and plant was much reduced, owing to the absence

ing of the furnace. Steam consumption is given as about 808 pounds per hour, with a jet  $\frac{1}{4}$  inch in diameter, and a comparison of this with a cupola of similar dimensions worked with forced blast from a 8 horse-power Root blower, needing to drive it about 198 pounds of steam per hour, shows there is no economy obtained by means of the jet. Consumption of coke in two experiments mentioned in the German periodical *Stahl und Eisen*, in June, 1886, was 5 per cent. and 10.2 per cent. for melting only, and 9.9 per cent. and 12.7 per cent. total, including lighting up, or, taking the mean, equaled over 2 cwt. of coke per ton of metal melted. The use of the annular opening or slit effects a more even distribution of air inside of the cupola than is possible in Woodward's system; but the above-mentioned result does not show a very marked saving in fuel, and this I attribute to the low pressure at which the air enters, namely,  $2\frac{1}{2}$  to 3 inches water-column, instead of 10 to 20 inches, as in the case of an ordinary cupola with a Root blower. Also, the pressure being weak, the oxygen of the air drawn in does not readily penetrate the pores of the coke, and therefore is apt to cause only a superficial combustion. Analyses of the gases at the top of a Herbertz cupola in the experiments above referred to show carbonic acid 10.7 per cent. to 11.5 per cent., carbonic oxide 0 per cent. to 8.4 per cent., and oxygen 6.7 per cent. to 8.2 per cent., or an average of 7.5 per cent. of oxygen. This 7.5 per cent. of oxygen is in excess of that required for combustion, and robs the furnace of considerably more heat than would escape at the top of the charge of 2.55 per cent. to 11.73 per cent. of carbonic oxide. The

excess of oxygen in an ordinary cupola causes extensive decarburization of the metal, but in the Herbertz system its action is not so injurious, owing to the melting zone being smaller, and the iron being consequently exposed to the action of the gases for a shorter time.

Krigar's cupola, with a receiver and induced current, was arranged so that the air, instead of passing up the shaft of the cupola, entered at two or three different levels below the top of the charge, and was drawn downward toward the melting zone by means of a steam jet placed in a chimney on the roof of the receiver. The gases helped to keep up the heat of the metal collected in the receiver, but the charge arrived at the melting zone almost cold after the passage through it of the cold air. The consumption of coke averaged about 13 per cent. as compared with the melted metal. The waste of iron was reduced by this system, because the molten metal was not subjected to any oxidizing atmosphere of ascending air. I cannot discover that this system has been tried in England; if it has, it has not met with much favor. In districts where the price of good coke is high foundrymen have sought to overcome this disadvantage by melting the iron with gas obtained from a gas producer, and so to use an inferior fuel without interfering with the quality of the castings. Dufrené patented an arrangement of a gas producer connected direct to an ordinary cupola. The air for the combustion of the producer gas circulated round the sides of the producer, and so became heated previous to uniting with the gas inside the cupola. The gas was admitted at the top of the crucible portion of the furnace, about the height at which the tuyeres are usually placed; just above this gas port was a grating, composed of refractory material, on which the pig-iron to be melted was placed.

An arrangement of Siemens regenerators working in connection with a cupola was brought out in 1884 by Mr. Bramall, of Sheffield. Each of the regenerators was alternately heated by means of the waste gases from the cupola, previous to the introduction of the producer gas. This appears, however, to be based on a wrong system, for, in order to heat the regenerators, the waste gases must be at a relatively high temperature, which would only be the case when the cupola was working badly. Another cupola working on a similar system was brought out by Henry Krigar, of Hanover. It consisted of two distinct shafts and a receiver. The pig-iron and scrap were charged into the shaft most remote from the receiver, which shaft was left open at the top, the fuel being charged into the second shaft, which was closed at the top. Blast, admitted into the stack of fuel only, passed through the lower portion of the coke and ascended the shaft containing the pig-iron; by this means the melted metal came in contact with the coke previous to passing into the receiver. The working of this furnace has not been attended with any success that I can hear of. At one time the utilization of waste heat at the top of the charge was considered to be one of the most important points in the economical working of a cupola. This was effected in various ways. First, the blast was passed through a series of pipes placed in the chimney of the cupola, but this arrangement was costly compared with the results obtained. Then the waste heat was made to traverse a chamber in which the iron and coke were stacked previous to being charged into the furnace; but very little, if any, economy was derived. At Woolwich a cupola was erected having a blast box extending over its entire height from the tapping hole to the charging level; the blast entered at the top and was raised in temperature by the heat radiating from the walls of the furnace. Attempts have also been made

to utilize the waste heat for raising the steam necessary for driving the fans, &c. But none of these ideas have proved successful, owing to the irregular and intermittent working of foundry cupolas.

In the different systems already mentioned, with the exception of Ireland's, this fundamental fact seems to have been entirely disregarded, namely, that carbonic acid coming in contact with red-hot fuel combines with a certain quantity of carbon to form carbonic oxide, thereby robbing the coke of some of its carbon; the complete conversion of the coke into carbonic acid seems to have been only a secondary consideration. In an ordinary cupola, with one row of tuyeres—usually placed about 2 feet 6 inches above the metal in the crucible, the carbonic oxide formed by the combustion of the coke in front of the tuyeres comes in contact, just above, with a layer of incandescent fuel, and a considerable portion is converted into carbonic oxide, which, having no oxygen to combine with, rises to the surface of the charge, and, meeting with the oxygen of the atmosphere, burns, if hot enough, with its characteristic blue flame, or if too cold to ignite passes away invisibly. According to the experiments of Favre and Silbermann, the calorific power of 1 pound of carbon burning to carbonic acid is about 14,040 heat units, while that of carbon burning to carbonic oxide is only 4450, or 9590 heat units less; therefore, unless this carbonic oxide can be burnt so that the heat of its combustion can be utilized in raising the temperature of the descending charge a serious waste of fuel must, of necessity, take place. As the formation of carbonic oxide cannot be prevented, obviously the requirement is a sufficient quantity of air to burn the gas above the point of its formation. M. Voisin was one of the first to direct his attention to this point, and later Ireland brought out his cupola, which has been previously mentioned. Voisin employed two rows of tuyeres, the upper row being placed at the level at which the formation of carbonic oxide was greatest, this level being ascertained by taking the temperature at different heights. Undoubtedly he was on the right road, and deserves all the credit due to a pioneer; but his efforts met with only partial success, and this from a very simple reason, viz., that the combustion of the carbonic oxide at once ignited the hot coke, and, in fact, caused an upper zone of fusion, above which the original process was repeated by the absorption by the carbonic acid of an equivalent of carbon from the glowing fuel, and the consequent reduction to carbonic oxide and loss of heat.

Since then several scientists have made attempts to more completely utilize the waste gas, but they have invariably stumbled at the crucial point, which was to burn the gas without attacking the solid fuel. This difficulty would, however, at last appear to have been overcome, and that in a small town in Hungary, where the engineers, Arthur Greiner and Thuisco Erpf, went on quietly experimenting until they hit on the plan of arranging a number of small blast inlets over an extended upper zone of the body of the cupola, through which, by careful manipulation of the blast, they managed to convert practically the whole of the carbonic oxide into carbonic acid below the surface of the charge. In the words of M. A. Gouvy, in a paper read before the Société des Ingénieurs Civils, Paris, in May last year: "This system is such a decided advance on all previously known methods of cupola-working, and in the direction of true economy, that it may be well to devote rather more time to its consideration." Greiner and Erpf's cupola was described and illustrated in *Iron* of July 29, 1887. The analyses made by Messrs. Pattinson and Stead show that this invention effects in a very complete manner the

utilization of the carbonic oxide. The samples were taken from the waste gases just above the charge, near the inside lining, of two cupolas at the works of the Anderston Foundry Company. One of the cupolas was of the ordinary first-class foundry pattern; the other was a similar cupola altered to Greiner and Erpf's system.

	Ordinary cupola. Per cent.	Greiner and Erpf's cupola. Per cent.
Nitrogen.....	75.5	79.92
Carbonic oxide.....	11.5	1.25
Carbonic acid.....	12.5	18.75
Hydrogen.....	0.5	0.08
Total.....	100	100

Messrs. Pattinson and Stead, in a note on these analyses, say: "The results show that the heat developed in the cupola, where the gas produced at the main tuyere is burnt by air injected above, is about 80 per cent. greater than is developed in the ordinary cupola. For many reasons the practical saving of coke in large cupolas will not reach that point, but the results prove beyond doubt that the system is a correct one, and must result in considerable economy of fuel."

From these analyses we find that in the ordinary cupola 9488.2 heat units are developed per pound of carbon. Taking the melting-point of cast iron as 2780° F., its specific heat as 0.13 and 40° F. as the average temperature of a pig of metal, coke containing 89 per cent. carbon, we get

$$2780 - 40 = \frac{2740 \times 0.13 \times 22.40}{9488.2 \times 0.89} = 95 \text{ pounds,}$$

the amount of coke required to melt 1 ton of cast-iron. To this must be added the following:

Melting slag and burning limestone..	} 2.87 lb.
Carbon burning to CO.....	
20 lb. slag per ton of metal.....	} 9.9 lb.
Carried off by waste gases at temperature 770° F.....	
6 per cent. for radiation.....	5.7 lb.

Total coke per ton of metal melted 113.47 lb.

In a similar manner from the analysis of the waste gas from Greiner and Erpf's cupola we find 13,465 heat units developed per pound of carbon, and using the same calculations we get:

$$2780 - 40 = \frac{2740 \times 0.13 \times 22.40}{13465 \times 0.89} = 66.6 \text{ lb. coke.}$$

Adding the following:

Melting slag and burning limestone..	} 1.9 lb.
Carbon burning to CO.....	
20 lb. slag per ton of metal.....	} 9.9 lb.
Carried off by waste gas at 770° F.....	
6 per cent. for radiation.....	4.0 lb.

Total coke per ton of metal melted. 82.4 lb.

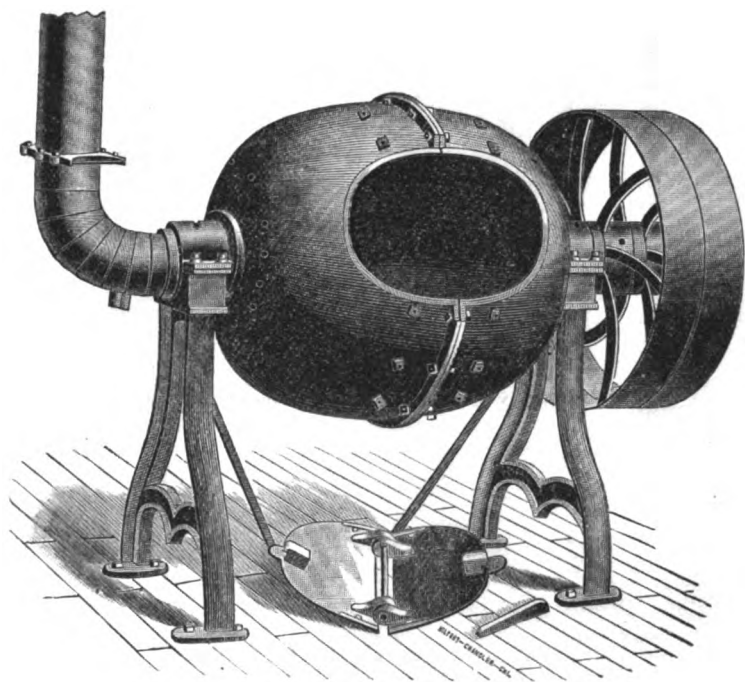
Or a reduction in coke consumption of about 27 per cent. as compared with the ordinary cupola.

Some of the results obtained in the Greiner and Erpf cupola are indeed remarkable. At a foundry in Magdeburg it is stated that the consumption of coke, exclusive of the bed coke, has been brought down to 3.2 per cent., or 72 pounds of coke per ton of iron melted. I confess that this seems to me inconceivable, but at several of the German works they claim now to be working with 4 per cent. and  $\frac{1}{4}$  per cent. of coke—i. e., 90 and 100 pounds per ton, and I have ascertained that from 100 to 130 pounds is now the regular consumption in several cupolas to which this system of utilizing the combustible gases has been applied in this country. In conclusion, I will again use the words employed by M. Gouvy in his paper before mentioned. He says: "The consideration of the different methods employed for melting iron in the cupola leads me to the conviction that the best results, as regards the cost of production, have been obtained with the apparatus in which

the complete combustion of the carbonic acid has been chiefly considered. The use of hot air, the utilization of the gases from the top of the furnace, the replacing of the blast under pressure by a natural or induced current, the injection at the tuyeres of a foreign matter such as pulverized coal, &c., do not appear to have given any actual economy."

#### Exhaust Tumbling Barrel.

The engraving here presented shows a new form of tumbling barrel designed for their own use by the Stover Mfg. Company, of Freeport, Ill. After having thoroughly tested the working qualities of the barrel the makers decided to place it upon the market. At one end of the egg-shaped barrel is an exhaust-pipe connected to the hollow journal; at the opposite end is a tight and loose pulley. The barrel is provided with a sectional lining of hard iron, which can be easily replaced when worn out. A current of air is forced through the barrel by an exhaust fan, which re-



THE STOVER EXHAUST TUMBLING BARREL.

moves the dust and carries it out through pipes arranged for the purpose. The makers claim that it does more and better work, takes up less room and fewer barrels are required for a given amount of work than any other on the market.

#### The Experimental Stage of High-Speed Cruisers.

A Washington correspondent of the *New York Times* says:

Letters from the naval officers in charge of the trial of the new steel cruiser *Charleston*, at San Francisco, show that she is having exactly the same trouble that her prototype, the *Naniwa-Kan*, had during her many trials, and it could all have been avoided had the Navy Department or the contractors been given the benefit of the experience of that vessel. The building of modern high-speed cruisers is still in the experimental stage, and when the Armstrongs sold Secretary Whitney the plans and specifications of the *Naniwa-Kan*, either by accident or design they failed to communicate to him the result of their experience in her 23 trials, as, in fact, they carefully avoided telling him that the vessel had made 22 failures before her final success.

The result was, then, that when the *Charleston* put to sea and attempted to run her engines under false draft her guide-shoes and motion-bars quickly heated and she had to be stopped. Everything had worked smoothly under natural draft with no signs of heat; but as soon as an attempt was made to force her these parts heated, though all the rest of the engines ran as before. The adjustments were all right, but it was found that the steel guide-shoes would heat whenever an attempt was made to run at high speed. The vessel was taken back to San Francisco for the purpose of replacing the guide-shoes with white metal, and just about this time one of the naval officers ran across an account of the experience of the *Naniwa-Kan*, which, had it been known before, would have saved all the trouble. It was found in a paper read before the Northeast Coast Institute of Engineers and Ship-builders by Mr. F. C. Marshall, the designer of the *Naniwa-Kan*'s engines, in which he says:

In the case of the horizontal engines of the type shown in plate III (the *Naniwa-*

*Kan*), in the first instance they had considerable trouble with the guide-shoes and motion-bars, but that arose, they found, from the fact that they had adopted the same principle and material for the guide-shoes of motion-bars, which are of steel, as they did when the bars were of cast-iron, as was the common practice in ordinary merchant vessels. They found that the bars heated when worked above a certain velocity. The oil burned off and the application of water rendered the abraded surfaces so hard that no tool could be made to cut them, and they had great difficulty with them. The guide-bar shoes were subsequently fitted with white metal and with special arrangements for supplying oil, and the result was that they had not the least difficulty even with a working velocity of 850 feet per minute.

There is a considerable scarcity of coke in the East, caused by the inability of the railroads to make shipments to that point. The operators at the coke works state that this will be remedied in a few days, and coke will be sent East by a roundabout way over the Allegheny Valley Railroad. Some of the works in the Connellsville region have been closed down until this arrangement can be made, while others, in

preference to closing their works, have been shipping coke to the West and stocking that market. When arrangements are completed for sending coke East, shipments to the West will be stopped for a few days, and all the coke produced will be sent to the Eastern market until the supply equals the demand. There will be no advance in prices on account of the temporary scarcity.

#### Enormous Ore Shipments.

From the *Marquette (Mich.) Mining Journal* of the 1st inst. we take the following:

The shipments of iron ore from the mines of Lake Superior for the month of May by water have undoubtedly slightly exceeded 1,200,000 tons. Our shipping report shows that on the 29th a total of 1,166,867 tons had gone forward by lake from the mines of the four great ranges, and the shipments for the last three days of the month have certainly carried the aggregate for May beyond the figure named. For the corresponding period last year the quantity of ore shipped by lake from the same ports was 374,348 tons, the gain over 1888 being 791,938 tons, or at the rate of over 200 per cent. This is a marvelous showing, and would give augury of a tremendous season's output if there were any likelihood of the May rate of shipments being maintained from now on to the close of navigation; but, of course, that is quite impossible, for even if the mines could furnish the ore the market could not take such a quantity. The shipments for the week ended Wednesday amounted to 242,664 tons, this being the largest week's work on record. Of this total 46,655 tons went from Marquette, 103,984 from Escanaba, 1945 from St. Ignace, 52,846 from Ashland and 37,234 from Two Harbors. The shipments from Marquette were appreciably affected by the strike on the ore docks here that began on Monday and has since continued, as a large fleet of vessels was held here for a couple of days in the early part of the week, and the destination of others that were bound for this port was changed as soon as it became known that the railroad company were having trouble with the force of men employed on the ore docks, else the total for the week would have reached even a larger figure than the footing shown in our statement of shipments.

The American engineers were hospitably received on their arrival in Liverpool. They reached the Mersey on the 5th inst. in two detachments, the first being the members of the American Society of Civil Engineers and party, who came by the City of New York, and the second representative members and their friends of the Mechanical and Mining Engineers, who arrived by the City of Richmond. A general reception committee, embracing most of the prominent men in Liverpool, was formed, and with them were combined a distinguished deputation from the Institution of Civil Engineers and other technical societies of Great Britain and Ireland, and representatives of the Liverpool Engineering Society, to welcome the Americans on their arrival in England. An interesting feature was an excursion to Laird Brothers' Birkenhead Iron Works and to the Mersey Tunnel Railway, followed by an official reception by the Mayor of Liverpool in the Town Hall.

Advertisements issued by the Navy Department call for proposals for furnishing about 428 tons of steel protective deck-plates, 40 pounds per square foot, for the armored cruiser *Maine*. The deliveries are to be completed within 60 days after the contract is made, and proposals will be received up to July 8.

### New Electric Plant at Salem, Mass.

The Salem (Mass.) Electric Light Company, finding their present station entirely inadequate to the needs of their rapidly increasing business, are now erecting a new one designed by the Thomson-Houston Electric Company. The new station will be a model of its kind, and in its construction are combined many new features and improvements in central station work. Owing to the shape of the lot of land owned by the company it was deemed expedient to erect two buildings. The boiler-house, therefore, has been made independent of the building containing the engines and dynamos. The engine and dynamo house is two stories high, the first story, where the engines are situated, being 14 feet, and the second, where the electrical apparatus is placed, being 12 feet. This building is built of brick throughout and is 102 feet long and 56 feet wide. The boiler-house is 92 feet long, 54 feet 4 inches wide and 23 feet high. The chimney is 130 feet high, 6 feet inside diameter, and 13 feet square at the base. The foundations are rubble stone placed on piling capped with concrete; 798 spruce piles were used under the main building and 52 oak piles under the chimney.

The steam plant, which is compound condensing, consists of one 350 horse-power double tandem compound engine, made by McIntosh & Seymour, and one 150 horse-power high-pressure Fitchburg, now in use at the present station. The boilers were made by the Cunningham Iron Works, and are three in number, 6 feet in diameter, 17 feet long, and 125 horse-power capacity each. The auxiliary steam apparatus consists of one 1200 horse-power surface condenser, a Knowles air and circulating pump, and a feed-water heater situated in the smoke-flue.

The station is built to allow the addition of 1000 horse-power, and there is room for 9 additional boilers and another line of shafting. The station has a capacity of 42 dynamos. At present there will be 14 in use, 11 of which will be arc and 2 alternating current machines, and 1 will be a generator for railway work. On the second floor are the store and testing rooms and superintendent's office. A coal-shed will be built in the rear of the boiler-house, which will have a capacity of 1500 tons, and a track constructed for bringing coal from the shed to the boilers.

The company inform us that no pains will be spared to make this station complete even to the smallest detail, so that it will be one of the finest electric light and power stations in the New England States.

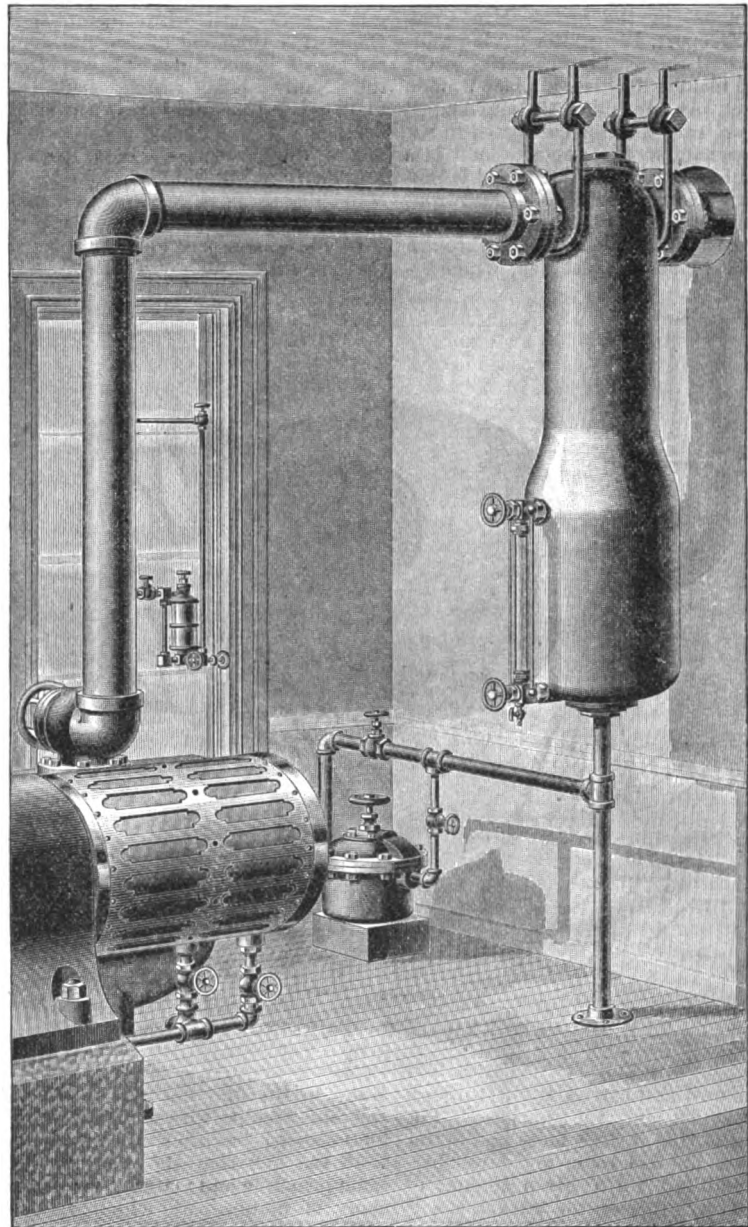
Sergeant Stewart, in charge of the Signal Service Bureau, says that the fall of water on the Conemaugh shed at Johnstown up to the time of the flood was probably  $2\frac{1}{2}$  inches. He believes it was much heavier in the mountains. The country drained by the Little Conemaugh and Stony Creek covers an area of about 100 square miles. The bureau, figuring on this basis and  $2\frac{1}{2}$  inches of rainfall, find that 464,640,000 cubic feet of water was precipitated toward Johnstown in its last hours. This is independent of the great volume of water in the lake, which was not less than 250,000,000 cubic feet. It appears that the actual rainfall on the Conemaugh water-shed registered on Friday up to the time of the catastrophe was about  $2\frac{1}{4}$  inches. Colonel T. P. Roberts, a leading engineer, estimates that the lake drained 25 square miles, and gives some interesting data on the probable amount of water it contained, arriving at the conclusion that the total flood of

water was 890,000,000 cubic feet, based on a rainfall of about 8 inches over the entire area.

### The Stratton Steam Separator.

The advantage to be derived from the employment of dry steam is well known and appreciated by engineers. The apparatus of which we herewith present engravings is designed to separate the particles of water carried over by the steam from the boiler and to deliver dry steam

clearly shown in the sectional view, from which also an idea may be obtained of the course taken by the steam in its passage through the separator. Depending centrally from the top of the separator is a cylindrical pipe which ends about at the middle of the shell. This pipe forms a continuation of the outlet-pipe. The steam enters at the top of one side of this pipe and in its downward journey follows a spiral course around the pipe. Naturally, the particles of water carried by the steam, being the heavier, are thrown by centrif-



THE STRATTON SEPARATOR.—VIEW SHOWING THE CONNECTIONS.

to the engine. The perspective view on this page shows the method of connecting the separator. The top of the separator is placed in the steam-supply pipe as near the engine as may be convenient. From the bottom of the separator extends a pipe leading to the sewer. A short distance from the separator this pipe is tapped to form a connection with a steam-trap having a suitable outlet. The water taken from the steam which is passing to the engine collects in the bottom of the separator, from which it is automatically drawn by the action of the trap. If from any cause the trap should refuse to work the water may be drawn off by closing the valve in the pipe leading to the trap and then opening the valve in the main pipe. The construction of the separator is

ugal force against the sides of the shell, down which they trickle and collect at the bottom. The lower half of the shell is widened in order to prevent those particles which are still held in suspension by the steam from being carried out with it. The dry steam then passes upward through the cylinder and on to the engine. A glass gauge indicates the quantity of water collected and tells when it should be drawn. For small sizes the separator is made in a single casting, as shown in both the perspective view and the section. The other view represents a large-size separator, in which the top is of cast-iron and the shell of riveted steel plates. This separator embodies the latest improvements made by the Stratton Separator Company, of 32 Cortlandt street, New York City.



### The Vermillion Range Mines.

We have interviewed John Birkinbine, of Philadelphia, with regard to the reported danger of a craze in Vermillion range mining stocks. Mr. Birkinbine is well informed concerning matters in the Minnesota iron-ore district and speaks from personal knowledge obtained through frequent visits to that section. He says:

I have just returned from Duluth and can only say that if, as *The Iron Age* says, there is "danger of a mining-stock craze" in the Vermillion range of Minnesota "similar to the disastrous Gogebic speculation which prevailed some two years since," there are few local indications of it. There are, of course, boomers

ported in demand now at 75 per cent. of its par value, will frown down and expose in their own interest any boom which would react upon their own investments. The conditions in the Vermillion range are vastly different from those on the Gogebic range in 1886, and the story of the Gogebic is too fresh for repetition. Several attempts to get up big deals on the Vermillion range have failed, and it is probable that the developments in the future will be on a moderate scale and the money invested will be employed for judicious development.

That there is excellent ore in Minnesota along the iron range is beyond doubt, and there are undoubtedly large deposits as yet undiscovered or unde-

### Apprentices in German Machine-Shops.

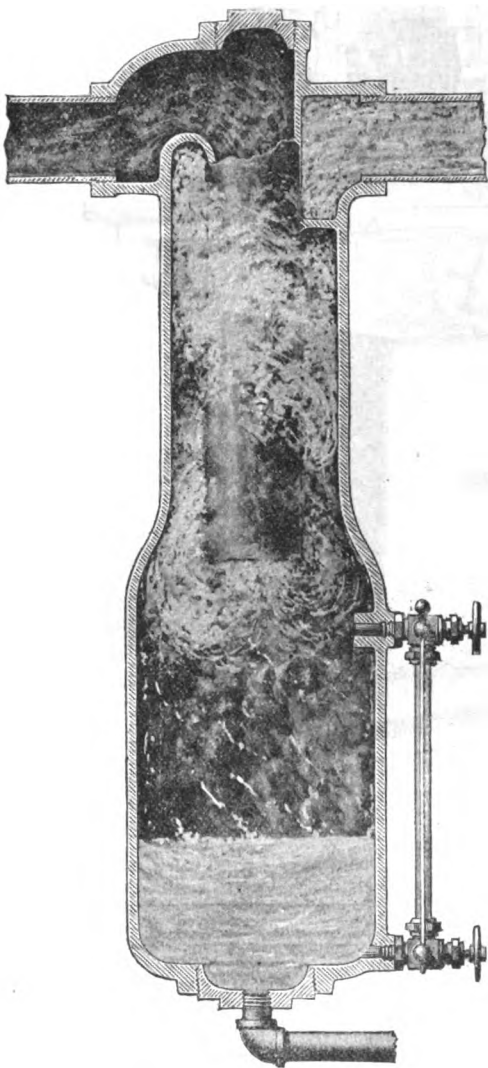
In the report of Commercial Agent Smith, at Mayence, the system of education in German machine-works is dwelt on as follows: In the machine-shops and such works apprentices are generally taken either for a particular kind of work, such as smith, planer, turner, &c., or are trained principally for this work, and then in the last year of the apprenticeship introduced to machine-building and intrusted with work in all divisions of the factory. The apprentices are generally placed under the supervision of a head workman, foreman or boss. In the well-known Marienhütte, at Kolzenau, they are usually put in charge of a particular workman. The agreement is in writing, and the apprentices must all attend a trade school run by the works. At the Wilhelmshütte, in the same district (Breslau-Liegritz), the apprenticeship is for four years, by written indentures.

The apprentices receive neither board, lodging nor clothing, but are paid such wages as the managers of the works think just. Each week 12 cents are withheld from the wages as security against the departure of the apprentice, and if he leaves the works before the apprenticeship expires he forfeits what has been thus deducted from his wages and \$12 in addition; but if he serves out the apprenticeship what has been weekly withheld from him is paid to him in a lump sum, with interest. The workmen all keep an eye on the apprentices, both within and without the workshops, and they are instructed in all the branches of work of the company, passing gradually from one grade of work to another.

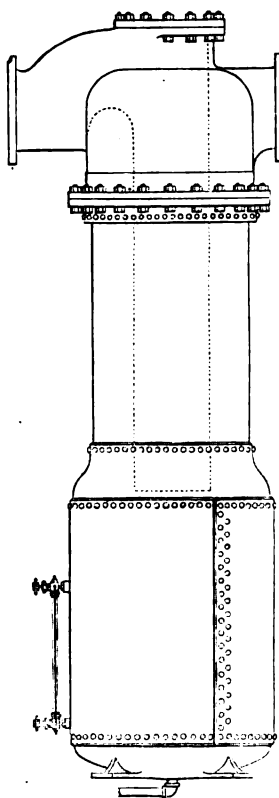
Special attention is given to the training of apprentices in the Deutzer Gas-Motor Factory, where 10 to 15 apprentices a year are taken. The length of apprenticeship is four years, and the instruction is given by the bosses and elder foremen. To the aptest of the apprentices opportunity is given to learn all the branches of work carried on in the establishment. In the evening the apprentices have to attend an industrial school connected with the factory.

The training of the apprentices in the railway repair shops is said to be admirable, and they are given a much more general training than occurs in many private establishments, in which they generally get a more or less one-sided training. At the large shops of the State railways not more than eight or ten apprentices are taken a year as a rule. They must not be less than 14 years old and not more than 16, though in exceptional cases they may be up to 18 years old, and the sons of the ordinary railway employees and permanent workmen are taken in preference to others. During the apprenticeship, which is four years in length, they live with their families or in good families of the place of work. They are paid small wages, but not up to the lowest wages earned by a journeyman in their line of work, and of these wages a tenth is withheld until the conclusion of the apprenticeship. Grave misconduct on the part of an apprentice shuts him out from future employment in any of the workshops of the State.

The new steel screw steamer *Lumen*, built specially for carrying petroleum in bulk, by W. G. Armstrong, Mitchell & Co., of Newcastle, takes a cargo from Bayonne, N. J., to Rotterdam. Her dimensions are as follows: Length, 304 feet; breadth of beam, 37 feet 9 inches; depth, 27 feet 9 inches; her carrying capacity is estimated at 3500 tons. The engines are of the triple-expansion type. The *Lumen* on her trial trip attained a mean speed of 10½ knots per hour.



Sectional View of Separator.



Separator for 12-Inch Pipe.

and speculators on the *qui vive* to take advantage of any opportunity for starting such a craze, but the chances of success are small. The properties are held by numerous owners, and in many cases there are disputed titles, which will act as barriers to any wild schemes being developed. The Chicago and Minnesota Ore Company, lately the Minnesota Exploration Company, have a corps of men constantly engaged in explorations, and it is hardly to be expected that a company with \$2,000,000 capital which is now producing from its Chandler Mine 1000 tons of ore per day and whose stock now commands 60 per cent. of its par value will stand idly by and see good properties pass into irresponsible hands.

The Minnesota Iron Company are producing from their town mines 2000 tons of ore per day, and carrying it and the ore from the Chandler Mine over their railroad, and those who control the \$14,000,000 capital of this company, which is re-

veloped. These deposits will be the means of bringing handsome returns to those who invest judiciously in them. There are also many properties whose development will cause disappointment to the owners, but only actual work will demonstrate one or the other. There will also be efforts made in certain localities to float companies on small bases, but there appears to-day little reason to believe that this will reach a craze in the Vermillion range.

One basis for the rumor of a mining-stock craze may be the fact that in order to control more than 5000 acres (the limit allowed by the State), the parties interested in the Chicago and Minnesota Ore Company have organized seven or eight different companies, and few outsiders know anything concerning these corporations; hence they are each counted as separate organizations *de facto*, while they are really merely formed so as to legalize a large land ownership.

### The American Tinned Plate Association.

A special meeting of the American Tinned Plate Association was held in their office, in the Lewis Block, Pittsburgh, on the afternoon of the 4th inst. This was the first meeting held by the association for over two years. The object of the meeting was to receive the resignation of the secretary, John Jarrett, who has been appointed consul to Birmingham, England. The meeting was well attended, but the members from the East could not be present owing to the bad condition of the railroads. They sent telegrams and letters, which were read, announcing the cause of their absence. President W. H. Lewis was in the chair. After an informal talk on the condition of the iron and steel trade, the following resolutions were unanimously adopted:

*Whereas*, Our worthy secretary, Mr. John Jarrett, has been appointed consul to Birmingham, England, by the President of the United States; therefore

*Resolved*, That we, the Tinned Plate Association, accept his resignation with feelings of sincere regret; and

*Resolved*, That we bear testimony to the loyal enthusiasm with which he has so zealously guarded the interests of American industries, and his upright career through all the various gradations from an iron-worker to his present eminently honorable position of consul.

It was resolved to continue the association and to retain the present office in the Lewis Block. M. C. Cronmeyer, of the United States Iron and Tin Plate Company, Limited, was elected to succeed Mr. Jarrett as secretary, and will be assisted by Charles Gilpin, of the M. Dewees Wood Company, of McKeesport, Pa., one of the vice-presidents of the association.

### Canadian Tariff Changes in the Direction of Free Materials.

The Treasury Department has received the full text of the changes in the Canadian tariff law recently promulgated by orders in council. The changes seem to be designed to encourage Canadian manufacturers by making free to them the materials used in their products. In the metal schedule the following articles are made free, subject to the conditions in each case stated:

Wire of iron or steel, Nos. 13 and 14 gauge, flattened and corrugated, used in connection with a machine known as the wire-grip machine for the manufacture of boots and shoes and leather belting, to be used for those purposes only in their own factories.

Plow plates, mold-boards and land sides.

Wire of iron or steel, galvanized or tinned or coppered, or not, of No. 16 gauge or smaller, when imported by manufacturers of wire-cloth, wire-work, brushes, pianos and plated-ware, to be used for these purposes only in their own factories.

Steel of No. 12 gauge and thinner, but not thinner than No. 30 gauge, when imported by manufacturers of wire-cloth, wire-work, brushes, pianos and plated-ware, to be used for these purposes only in their own factories.

Steel of No. 12 gauge and thinner, but not thinner than No. 30 gauge, when imported by manufacturers of buckles, clasps and ice-creepers, to be used for these purposes only in their own factories.

The Reading Trust Company, assignees of the Reading Iron Works, have decided to sell the entire plant, furnaces, rolling, pipe, tube and sheet mills, forges, foundries, &c., and numbers of tracts of land in Reading on July 1. This, it is believed, will result in an early resumption of the works

### Knife-Grinding Machine.

The machine here illustrated is a late production of the Diamond Machine Company, whose main office is at Boston, Mass., and Western office at Chicago, Ill. It is designed to grind knives or any other work up to 30 inches in length. It has automatic power feed, both lateral and longitudinal, obtained by a new device. The angle-iron on which the platen or table to which the knife or work to be

in the small detail cut, Fig. 2. By loosening the yoke-screw the workman is able to swivel the angle-iron to any desired position or pitch to the wheel. This feature will commend itself to the user of the machine. Long engine-lathe boxes are provided, which can be readily replaced when worn. Extreme care has been taken to exclude emery dust from the bearings. The water-hood is so arranged that all water is distributed directly on the wheel in front of the work to be ground, thus

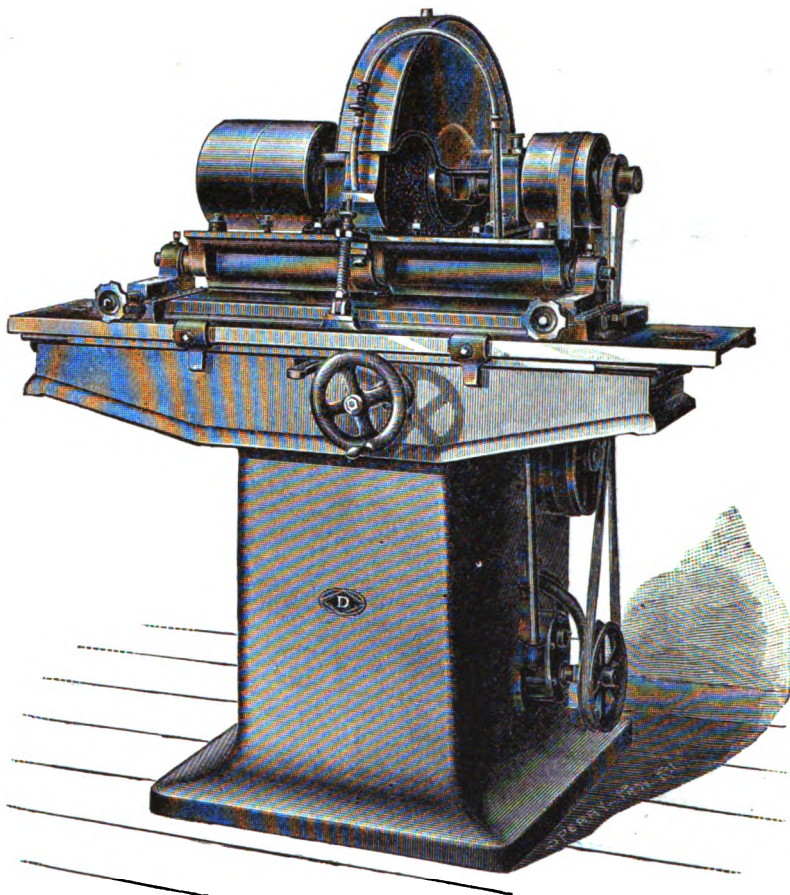


Fig. 1.

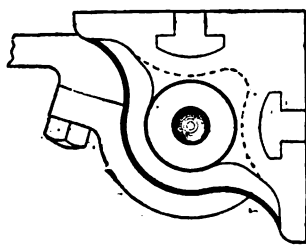


Fig. 2.

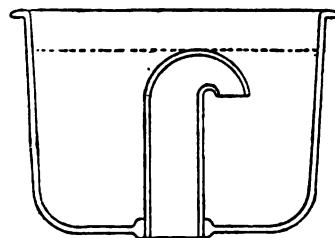


Fig. 3.

### THE DIAMOND KNIFE-GRINDING MACHINE.

ground is clamped can be reversed so that the workman can grind to or from the edge as he wishes; also directly across the edge, or square face, if desired. The platen or table is exceptionally wide and furnished with extra width of ways to traverse upon. It is also provided with small hand-wheels at one end, to bring the work to be ground to the wheel on a parallel line, then to retain its parallel lines. There is an automatic driver for feeding the emery-wheel forward to the work as it is ground away. It can also be operated by hand movement when desired. The center of the angle of knife-bar is inclosed by a split yoke, as shown

preventing drawing the temper. The inside hood leads all water and spray directly back to the upper tank; is provided with a syphon, Fig. 3, for which a patent was recently granted the Diamond Company. This device avoids taking any of the emery and the sediment that comes from the wheel and the work to the lower tank. The pump that takes the water from this tank to the wheel is made of brass, and so designed that it will not clog up from prolonged use. The machine weighs complete, as shown, for 30-inch knife-grinding, 11,000 pounds, using wheels 22 x 1½. It is also made in five other sizes, taking work up to 100 inches.

## THE WEEK.

Authentic advices received from the West state that the Cincinnati and all the Chicago lead companies have joined the National Lead Trust Company.

A unique exhibition is to be opened at Fort Worth, Texas, on the 20th inst. An extraordinary building is to be constructed of wheat, corn, cotton, sea-coast shells and other Texan products. This will groan under the name of Karporama. It will have Moorish windows, mansard domes, Chinese pagoda towers, a Roman porch, a tower with Norman Gothic battlements and a surmounting dome. The big dome will be covered entirely with wheat, and the towers will be made each of a product—one of corn, another of cotton, one of wheat, one of shells of the ocean, and so on. Hence its name, Karporama, from the Greek, meaning a view of the fruits of the earth.

The substitution of metal ties for wooden ones in railways for agricultural purposes is the subject of a report from the Agricultural Department, prepared by Engineer Trotman. The Department was induced to look into the subject in view of the large destruction of the forests of this country for railway-ties. The conclusion is drawn that metal ties are able in point of efficiency to compete with wooden ties, and that their use is extending, but that in point of economy, considering the first cost and durability, the result depends upon the material, the state of the metal market and upon local circumstances.

The contract for the zigzag tunnel, 1600 feet long, to be built in Delaware County, N. Y., for the New York, Ontario and Western Railroad, has been awarded to Ward & Lary. Estimated cost, \$600,000.

The proposed salt combination, in which several of the largest New York dealers are interested, will probably be organized in the fall. The idea is to introduce improved machinery, and by doing business on economic principles reducing the cost of manufacture, but without materially influencing the prices to consumers. As a part of the scheme Englishmen are appraising the salt works at Syracuse.

The spinners in Clark's thread mill, in Newark, accepted a reduction of  $7\frac{1}{2}$  per cent. in wages and returned to work.

No action is likely to be taken at Washington with reference to the proposed duty on Canadian railroad cars, but some new and stringent regulations may be prepared to prevent the retention of Canadian cars in this country for domestic traffic.

The entire business portion of Seattle, on Puget Sound, was destroyed by fire 6th inst., entailing a loss estimated at \$6,000,000 or \$8,000,000. The burned district comprises 64 acres, or 31 blocks. The fine water-front, including all the wharves and docks, the coal-bunkers, the railroad tracks and gas-works, were completely burned. The Arlington and Commercial hotels, the coal-bunkers of the Oregon Improvement Company, the docks of the Oregon Railway and Navigation Company, the tracks of the Puget Sound Shore Railroad and the Columbia and Puget Sound Railroad, the big new warehouse of the Seattle Transfer Company, the Mechanics' Mill, the Branch Iron Commission store, wholesale warehouses along the water-front and Stetson & Post's sawmill are included in the general destruction. The heaviest losers are H. L. Yesler, ex-Governor Watson, C. Squire, J. M. Coleman, the Oregon Improvement Company, A. A. Denny, the Seattle Transfer Company, the Oregon Railway and Navigation Company, the banks, Bailey & Gatzert, Schwabacher Brothers

& Co., Toklas, Singerman & Co., the Safe Deposit Company, the Puget Sound Shore Railroad, the Columbia and Puget Sound Railroad, Judge Thomas Burke, Dexter Horton, E. Sanderson, George F. Frye, Stetson & Post, the Commercial Mill Company, the Mechanics' Mill Company, the Seattle Ship-building and Dry-Dock Company, the Terry estate, Hillory Butler, Isaac Cohn, J. S. Bailey, Captain Starr, L. S. J. Hunt, Angus McIntosh, the Gordon Hardware Company, the Seattle Hardware Company, Moran Brothers, Sutcliffe Baxter, J. F. McNatt, A. P. Hotaling, W. S. Ladd, John Collins (owner of the Occidental Hotel, valued at \$400,000), John Leary, William Shoudy, Harrington & Smith, J. A. Hatfield, E. Lobe, Levy & Co., and Canadian Pacific docks.

All the grain elevators in St. Louis, with one exception, have been consolidated under a single management. There are 11 of them, valued at \$4,000,000.

All the brick-layers in Cleveland have laid down their trowels, and the contractors decided to import workmen from other neighborhoods to take the vacant places.

Work on the great Merchants' Bridge, at St. Louis, is being pushed with vigor. The fourth caisson will be finished in a few days.

Two Russian men-of-war recently visited Corea, and report says the admiral, introduced by the Russian minister, had a protracted conference with the King, the object of which was the acquisition of an island in Fusan harbor as a coaling station. Judge Denny, lately recognized as the King's adviser, has always combated strenuously any attempts of other powers to obtain territorial rights in any part of the kingdom.

Among the labor bills passed at the recent session of the New York Legislature which have become laws under the approval of Governor Hill are the bill regulating the wages of laborers on public works at the uniform rate of \$2 per day, the bill for the better protection of skilled labor by the registration of union trade-marks, and the bill providing that all corporations shall pay wages in cash.

Jos. B. Francis, of Lowell, Mass., an engineer of experience, takes the broad ground that no earthen dam can be made even reasonably safe. On the other hand, Engineer Fteley, of this city, is far from condemning earth-work reservoirs. The dam at the Boyd Corners reservoir of the Croton Aqueduct he pronounces safe.

The iron tower at Hell Gate yields neither to jack-screws nor dynamite, and is now being separated into the original parts, one piece at a time.

In taking the manufacturing statistics of the new census the Census Bureau will follow the general plan of the census of 1880. Special agents in the cities will cover only those industries which are not covered by experts. The work will not begin until June 1, 1890.

The engine-house of the Salisbury Mine, at Ishpeming, Mich., owned by the Iron Cliffs Company, was burned last week. Loss on machinery and building \$50,000.

New York merchants in the Haytian trade are well satisfied with the reported success of Hyppolite, representative of the Northern faction, and a gradual recovery of trade with that country is predicted. The contest is spoken of as a battle of the people to secure constitutional government, and the right has prevailed. A fair coffee crop is expected, but not equal to that of former years. The logwood in store has been almost exhausted and no more has been cut. Haytian paper money

is now not worth in New York 40 cents on the dollar. Both Legitime and Hyppolite have issued large quantities of this scrip. It is said they will unload paper on the market, while any silver they get they will bury for future use. Dread of the yellow fever will for the present operate as a serious drawback, particularly in engaging seamen for steamships.

The Japanese and Mexican ministers have exchanged ratifications of the new treaty between their respective Governments. Mexico, therefore, is the first power to enjoy exclusive privileges in Japan, from which all foreigners hitherto have been debarred. The State Department at Washington has under advisement the steps that may be necessary to give effect to a treaty, similar in terms, drafted by representatives of Japan and the United States, but which has never been consummated.

Chief Arthur, of the Brotherhood of Locomotive Engineers, declares that no strike shall ever again have his sanction, as he is "opposed to strikes on principle."

Governor Hill has signed the Yates-Fassett Prison bill, to amend Title I of Chapter II of Part IV of the Revised Statutes, relating to State prisons and for other purposes connected therewith. One hundred men will be put to work in the foundry at Sing Sing as soon as possible, finishing stoves.

The Chesapeake and Ohio Canal, damaged by the floods, will probably be sold under foreclosure. The State of Maryland holds an interest equal to \$20,000,000, and is the largest creditor.

The Atlantic Transport Company, running between English ports and Philadelphia, have contracted for three new steel steamships 370 feet long, 44 feet beam, 30 $\frac{1}{2}$  feet depth of hold; registered tonnage, 6000. They will be built at Harland & Wolf's yard, Belfast, Ireland, and will be named the Michigan, Massachusetts and Mississippi, and will be finished in about two years.

On McCormick's Island, near Harrisburg, Pa., 15 acres are covered with logs to a height of 10 feet. The salvage laws as to logs are much complicated, and many lawsuits will follow as the floods subside.

Judge Bickerton, of the Supreme Court of the Hawaiian Kingdom, who is now in this country, says the present population of the islands is about 80,000, of whom about 25,000 or 30,000 are in Honolulu. The Americans predominate. The recent revolution, really one on paper only, has shorn the king of the almost unlimited power he possessed in levying taxes and general jurisdiction, and the country is now governed by a representative body. He describes the general feeling of the people as being in favor of annexation to the United States, and although the people are not unanimous in that respect now, he predicts annexation as the political future.

The New York Dock Department has approved of a plan for extensive improvements on the water front at the foot of Thirty-seventh and Thirty-eighth streets, North River, by the Pennsylvania Railroad Company, subject to supervision by engineers of the board. Several warehouses are in contemplation, and the entire expenditure may reach \$2,000,000.

A long, low craft, steadily moving along and throwing out from each quarter huge spouts of water, attracted attention on the East River during the past week. This vessel was the pneumatic propulsion craft Eureka, invented and owned by Mr. John Lecoy, of Brooklyn, N. Y. The fastest speed attained at any time could not have been over 5 knots



an hour, but that was enough to demonstrate the correctness of the principle under which Mr. Lecoy is working. The Eureka's motive-power comes from a series of explosions, the force of which is directed through two apertures, situated one in each quarter. The effect of the explosion when operated at the stern of the vessel is to drive the vessel ahead. To obtain a backward movement the force of the explosion is directed into two funnels, the apertures of which open one on each side of the vessel forward. The explosion results from the combustion of petroleum and air, the ignition coming from electric sparks.

The fastest day's run on record on a Transatlantic voyage—515 miles—was made by the City of Paris on her last trip over. The entire run, however, did not break the former record.

To give an idea of the rapidity with which the hulls of iron vessels become foul, the Ranger, at the Brooklyn Navy Yard, at her last docking had attached to her bottom as much as 12 tons of marine growth, and this, too, after she had been for some time in the fresh waters of the Sacramento River, in which a portion of the growth had perished. The Atlanta originally had a coating of anti-corrosive paint next to her plating, and an outside coat supposed to be proof against the attacks of barnacles. At the examination of her hull a few days ago it was found that the barnacles had eaten their way through the anti-corrosive paint and had firmly attached themselves to the ship's bottom. The frequent dockings of the Atlanta and the Boston have demonstrated the costliness of keeping steel bottoms in anything like a fit condition for satisfactory speed performances, and there is talk of sheathing them with an alloy of copper.

The coroner's jury in Westmoreland County, Pa., also that at Nineveh, find that the South Fork Hunting and Fishing Club are responsible for the loss of life by the recent disaster, because of negligence in repairing the dam. Much of the old part is standing intact, while adjacent parts of the new work are wholly carried off. There was no central wall of puddle or masonry either in the new or old dam. It has been the invariable practice of engineers for 30 or 40 years to use one or the other in building high dams of earth.

The great hotel at Rockaway is now in course of demolition. The only money ever made out of the gigantic speculation will be made by those who bought the old materials, paying therefor only \$29,000, a sum beggarly in comparison with the large amounts loaned by Morton, Bliss & Co. and other bankers for its construction. The purchaser says the plumbing materials alone would almost realize this sum for him. There are hundreds of tons of lead pipe, over 700 stationary marble-top wash-stands and 200 full-sized bathtubs lined with the heaviest zinc. Everything about the great building is of the best quality, and the \$1,500,000 expended in its construction is accounted for in the character of the work, nearly all of which is as good as when it was put in ten years ago. Altogether there are some 6,000,000 feet of lumber in the house—sufficient to build a town of 600 first-class cottages. Besides, there are some 5000 doors, 1200 windows—the glazing of which cost \$9000—28½ miles of iron gas and water pipes, 300 large radiators, and enough other odds and ends to furnish a city.

Silk culture in California is likely to be abandoned, notwithstanding very good success in growing cocoons. The Governor says California cannot compete with China or Japan in that industry. If so, can any other State?

## MANUFACTURING.

### Iron and Steel.

The plant of the Western Nail Company, at Belleville, Ill., has been sold under foreclosure proceedings to Charles A. McNair, secretary of the Missouri Furnace Company and trustee for a portion of the stockholders, for \$40,000. The plant in question was at one time a highly-valued property. The nail mill proper was built some seven or eight years ago at a cost of about \$100,000, though the capital of the company did not then exceed \$50,000; but later it was increased to \$200,000. Some three years ago a costly steel plant was erected in connection with the mill, but since then the depression of the nail market and the strikes of the nailers have prevented its running, so that very little has been realized from the heavy investments made. Last year the mill was operated a few months by the St. Clair Nail Company, and arrangements are now progressing looking to the reopening of the plant. The property is situated near the Louisville and Nashville depot, in the northeastern part of Belleville, and embraces a 9-acre tract on which it is situated. The mortgages on the concern amount to \$100,000, and the bonds are held by the following parties: Belleville Savings Bank, \$30,000; First National Bank, Belleville, \$20,000; Missouri Furnace Company, St. Louis, \$25,000; Continental Bank, St. Louis, \$10,000; Brier Hill Iron and Coal Company, \$9000; Sligo Furnace Company, St. Louis, \$8000; D. Gilchrist, \$2000; Joseph Penn, \$1000. The owners have 15 months in which to redeem the property.

The facilities enjoyed by Carnegie Brothers & Co., Limited, proprietors of the Edgar Thomson Steel Works, at Braddock, Pa., by which they are enabled to turn out steel rails in large quantities on short notice, were shown last week. On Tuesday, the 4th inst., the firm received an order for 1000 tons of steel rails from the Pennsylvania Railroad Company to repair and replace tracks of the company that had been washed out for a number of miles by the flood at Johnstown. The order had to be commenced on raw material and the rolls had also to be changed. Notwithstanding this, the larger portion of the order was rolled, loaded and shipped within 24 hours. In 36 hours the entire order was completed and shipped to its destination. When it is taken into consideration that changes in rolls had to be made and the entire order filled from raw material, the work was remarkable, and it is believed that it is the quickest turn-out of steel rails on record.

The Phoenix Iron Works, of Cleveland, Ohio, have been engaged since the first of the year on a large order for cranes and machinery for the Anniston Pipe Works, at Anniston, Ala. The order includes about 25 cranes ranging in capacity from 5 to 30 tons each, and will aggregate near \$100,000. This, in addition to numerous other orders accepted and under way, has necessitated double time. These works have lately shipped a 5-ton traveling crane to the Volk & Murdock Iron Works, Charleston, S. C., and a 10-ton pivot crane to the American Bridge and Iron Company, Roanoke, Va.

The Laurel Coal and Iron-Company have been organized at Wheeling, W. Va., and application has been made for a charter. The following-named persons have been elected as directors: N. B. Scott, W. F. Stifel, J. F. Paull, S. K. Wallace, P. B. Dobbins, J. C. W. Brockunier, Joseph Speidel, E. Buckman and A. L. Rice. The board was organized by the election of S. K. Wallace, president, and P. B. Dobbins, secretary. The holdings of the company

comprise several thousand acres of valuable timber, iron ore and coal lands located in Logan County, W. Va. It is said that there are six veins of coal on the land aggregating 31 feet in thickness, and one of the veins a superior coking coal.

The Cleveland Rolling Mill Company, of Cleveland, Ohio, are filling large orders for forged work on the new Government vessels now building on the Eastern coast.

The Variety Iron Company, of Cleveland, Ohio, have been awarded the contract for the iron part of the new Island Bridge at Athol, Mass.

It is reported that the greater part of the Crescent Nail Works, owned and operated by the Standard Nail and Iron Company, at Standard, Pa., was washed away by the recent flood. The plant was a small one and contained but 18 nail machines.

The building department of the Shiffler Bridge Works of J. W. Walker, at Pittsburgh, is extremely busy at present. Work now under contract includes an iron casting-house for the Paducah Iron Company, of Paducah, Ky.; also an iron roof for an engine-house for the Ashland Iron and Steel Company, at Ashland, Wis.; also two iron buildings at the Black Diamond Steel Works of Park, Bro. & Co., Limited, at Pittsburgh. The bridge department of the same establishment is very busy on a large amount of iron railroad bridge work, and is running night and day to fill its orders.

Norristown Furnace, at Norristown, Pa., operated under lease by Isaac McHose & Son, chilled recently and is now undergoing repairs. It will not be ready for blast for some weeks yet.

A shaft for a new Bessemer engine was recently poured at the works of the Pennsylvania Steel Company, at Steelton, Pa., which weighed 45,000 pounds. The mold was 25 feet long and 29 inches in diameter. The casting was a perfect success. No. 2 blast-furnace of the above company, which has been idle for some time undergoing repairs, has again resumed blast. All the stacks of the firm, five in number, are now in successful operation.

Cofrode & Saylor, bridge builders, of Pottstown, Pa., have received the contract for the erection of the bridge across the Schuylkill River at City avenue, Philadelphia. The structure is to be an iron rectangular truss deck bridge, and will be 606 feet in length and wide enough for two carriages to pass, with foot-walks on either side. There will be five spans, two 114 feet long, one 170 feet and two 153 feet long.

The Jenifer Charcoal Furnace of the Clifton Iron Company, of Jenifer, Ala., was sold on the 18th ult. to the Jenifer Iron Company, of the same place.

The stack of the Chattanooga (Tenn.) Iron Company, which is only 12½ x 60 feet, produced during the month of May 2015 tons of iron, distributed as follows:

	Tons.
No. 1 foundry.....	487
No. 2 foundry.....	825
No. 3 foundry.....	554
Gray forge.....	5
No. 1 soft.....	118
No. 2 soft.....	26

It will be seen from the above that by far the larger part of the yield was of foundry iron.

The Aetna Machine Company, of Warren, Ohio, have received an order from the Youngstown Bridge Company, of Youngstown, Ohio, for an engine to drive the machinery in the bridge-works now building at Haselton, Ohio.



**Machinery.**

The electric coal-mining machines manufactured by the Jeffrey Mfg. Company, of Columbus, Ohio, have proved a complete success, and are now in operation in the mines of the Shawnee and Iron Point Coal Company, Shawnee, Ohio.

Wheelock Engine Company, now located on Union street, Worcester, Mass., will soon begin the erection of a new shop at South Worcester. The new plant will be built of brick and consist of one building, 150 x 90 feet, which will be filled with new and improved machinery for engine-building, and be the means of doubling the present capacity of the concern. The company expect to be in their new quarters in September next.

The Canton Mfg. Company, of Canton, Ohio, have just shipped one of their well-drilling machines to South America, and are finishing up another for shipment to a Southern Ohio point.

The Gordon Steam Pump Company, of Hamilton, Ohio, have been awarded the contract for the pumps to be used at the new water-works now building at Punxsutawney, Pa. The order was secured through the Pittsburgh agency.

The Westinghouse Electric Company, of Pittsburgh, have received an order from Oklahoma for a plant of 750 incandescent and 35 arc lights for the town of Guthrie. This plant will be the first of its kind in the Indian Territory.

The Thomson-Houston Electric Company have recently closed the following contracts for electrical street-car propulsion: Fulton County Street Railway Company, Atlanta, Ga., 8 miles, 8 cars; Attleboro, North Attleboro and Wrentham Street Railway Company, Attleboro, Mass., 6 miles, 5 cars; Americus Street Railway Company, Americus, Ga., 4 cars; Auburn Street Railway Company, Auburn, N. Y., 3 cars. The Thomson-Houston Electric Company have 50 railways under contract and in operation.

The Niles Tool Works, of Hamilton, Ohio, and the Morgan Engineering Company, of Alliance, Ohio, have established a branch office in Pittsburgh, Pa., for the sale of their products at No. 309 Penn Building, similar to those in New York, Philadelphia and Chicago. Robert A. Bole, for many years connected with the glass-manufacturing firm of W. H. Hamilton & Co., of Pittsburgh, will have charge of the combined interests of both companies. The Gordon Steam Pump Company, also of Hamilton, Ohio, have established an office at the same place, in connection with the two houses above named, in charge of John Hare, a practical engineer of long experience in the pump business and for seven years the representative of Epping, Carpenter & Co., of Pittsburgh. All communications addressed as above regarding machine tools, steam hammers, cranes and pumping machinery will receive prompt attention.

Trimble & Lutz, dealers in machinery supplies at Wheeling, W. Va., have recently secured a contract for fitting up a large building at that place with steam-heating apparatus. The order calls for 292 steam radiators, and was received in the face of some very strong competition from the largest cities in the country.

The Westinghouse Machine Company, of Pittsburgh, are fitting up a new machine-shop for large work on the east side of Twenty-fifth street and Liberty avenue in that city. A very large new planer, by Wm. Sellers & Co., is already erected and in operation, and a large new cylinder-boring machine, by the Pond Machine Tool Company, is now in process of construction.

Other large tools will be added. The new shop is rendered necessary by the company's heavy run of orders for large compound engines. During the month of May this company received orders for 66 engines, aggregating 3375 horse-power.

An extensive order received from Ashland Mine, in the Gogebic range, has just been filled by the Webster, Camp & Lane Machine Company, of Akron, Ohio. The order called for three hoisting-drums, each 10 feet in diameter, with a capacity of 1500 feet of cable and weighing over 100 tons; an automatic engine of 300 horse-power, a complete plant of boilers, with stacks and fixtures; also skids, sheaves and wire rope, all of which are to be used in connection with the hoisting machinery. The same order also included three hoisting-drums, each 10 feet in diameter, 1500 feet of cable and a 300 horse-power automatic engine for the Germania Mine. The firm has also recently turned out two engines for the Union Strawberry Company, at Anderson, Ind. The engines are each 300 horse-power, with cylinders 26 x 48 inches in size, and both propel an enormous belt-wheel 20 feet in diameter, weighing 25 tons. This wheel is made in two parts, which are bolted together, making a belt surface of 6 feet in width. The trade of this company is daily increasing, as the firm are building up a large custom in the mining districts all over the country.

The Diamond Machine Company, of Providence, R. I., manufacturers of grinding and polishing machinery, are just opening a new store and machinery repository at 35 and 37 South Canal street, Chicago, which will also be their Western office. They take pride in referring to this store as being one of the largest and best in its line in Chicago. They propose to keep a full stock of their own machinery, as well as other machinery of a varied character. All Western orders will be filled from the Chicago repository and office.

Rankin & Fritch Foundry and Machine Company, St. Louis, are building two large brick machines, with a capacity of 25,000 brick per day each, for the Kennedy Brick Mfg. Company.

Shultz Belting Company, St. Louis, Mo., are building a two-story addition to their works, to be used as a belt-room. An increasing business compelled them to make this move.

From the Thomson-Houston Electric Company, of Boston, Mass., we have received a neatly-illustrated pamphlet which describes their electric railway system in all its principal features and gives many of the principal lines constructed by them. The rapidly-growing adoption of the electric motor, especially for the propelling of cars, makes this pamphlet of value to all those towns in which the subject of electric railways is being discussed.

W. P. Davis, manufacturer of machine tools, whose office is at Rochester, N. Y., and works at North Bloomfield, in the same State, reports that his works are very busy, running overtime at present. He is bringing out a heavy large spinning lathe, 26-inch swing, an unusual lathe as regards size and stiffness, made for the Star Headlight Company, of Rochester; also a 30-inch special surface grinding machine to grind strips from 3 to 6 inches wide and 30 inches long. He believes this is a machine much needed on the market, as it will be built at a nominal price. He has not had quite as large a sale on key-seating machines for the past two months as previously, but the sale of his standard 20-inch drill seems to be steadily increasing. He has had some very large orders for them, principally from the trade, though some of the large

manufacturers order direct. Since establishing his sales-room and office in Rochester he has taken the agency of one of the largest engine and boiler concerns in the United States, and has already sold several steam plants.

**Hardware.**

Freeman Wire Company, St. Louis, Mo., are running full, the bulk of their orders being for office and store railings, cemetery and lawn fencing and elevator inclosures.

Collins-Gibbons Mfg. Company, St. Louis, Mo., report a large demand for their small-size wire-cutters. They have also recently filled a number of orders for their large-size automatic wire straightening and cutting machines.

**Miscellaneous.**

On Friday, the 7th inst., a charter was issued to the Monongahela Natural Gas Company, of Pittsburgh, capital \$1,000,000. The stockholders are David B. Oliver, H. W. Oliver, George F. Oliver, John Phillips and Horace Crosby, of Allegheny County, and E. C. Converse, of New York. The Bellevue district is to supply the gas.

Howell Wheel Company, Covington, Ky., have recently ordered \$2500 worth of new machinery, which when ready will be placed in their present plant, increasing their capacity to 400 wheels per day. A new addition is also being built to their works, 50 x 100 feet. The company have made several important improvements in the construction of their wheel, the demand for which has been far in excess of their productive capacity.

Wm. R. Thomas, superintendent of the Crane Iron Company, at Catasauqua, Pa., has been awarded a patent for an ore separator or concentrator. The invention has been pronounced a success.

Work on the new railroad bridge across the St. Lawrence River, at Quebec, will soon be commenced. The great depth of the St. Lawrence at that point has hitherto been an almost insurmountable obstacle to building a bridge there. This will, however, be overcome, as the present scheme provides for a cantilever bridge which will cost very nearly \$10,000,000. The width of the river from shore to shore is 24,000 feet. The two main piers will be built of granite, 500 feet from each shore, in about 40 feet of water. The cantilever bridge itself will be 1442 feet long and 408 feet above high-water mark. The total length of the bridge, including the approaches, will be 34,000 feet. When this bridge is finished the Canadian Pacific will have an uninterrupted line from the Atlantic to the Pacific Ocean through Canadian territory over the Intercolonial Railway to Halifax and St. John.

A line of electric street cars on an entirely new system is soon to go into operation in Pittsburgh. The idea is to propel each car independently without a cable, without a slot rail or any overhead wires, or even a central station and power-house. The vehicle is a combination car, of which the one part is occupied by the passengers and the other by the motive-power. The latter consists as the prime mover of a gas engine, tanks filled with condensed gas and a dynamo. The electric motor, however, will be placed under the second part. The tanks are filled with a sufficient amount of condensed gas to keep the engine supplied for 15 or 18 hours. The little gas engine in the front part of the car is connected with the dynamo and the dynamo with the motor. Each car will be fitted up in the same manner and run independently. All that is required is a filling of the tank in the morning before the cars start out, and then they will run for the whole day without interruption.

# The Iron Age

New York, Thursday, June 13, 1889.

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## Negro Labor in Southern Iron-Works.

A recent reference to negro labor in Southern iron-works which was published in these columns has attracted so much attention that additional information which has reached us on the same subject will doubtless be interesting. We are assured that it is the experience of Southern iron manufacturers that the negro is entirely available for performing all classes of work in rolling-mills as well as foundries. This class of labor has so long been employed in iron-ore and coal mining and at blast-furnaces that it is taken for granted that every one is familiar with the facts in that direction. More skill being required in rolling-mills and foundries, however, it was not generally regarded as a matter of course that negro labor would be entirely satisfactory there. But this seems to be the case. Those who are familiar with the condition of Southern iron-works before the war will probably recall in this connection the excellent force of negro workmen who operated the rolling-mill of Woods, Yeatman & Co., in Tennessee. A later instance of such labor brought forcibly to the attention of white workingmen was the substitution of negro puddlers from Richmond, Va., in the works of Park, Bro. & Co., at Pittsburgh, some years since, when their men struck. Wherever the negro has had a chance to acquire the necessary skill he has shown himself capable.

It is further remarked that negroes are anxious to get work in establishments of this character. Such an inclination is not to be wondered at, as it has been the experience of Northern manufacturers that a larger supply of labor than could be utilized was often available from the neighboring agricultural population. Better pay and regular hours of work are the strong inducements. It is not surprising that Southern manufacturers claim that negro workmen are more easily controlled than the workmen engaged in the same class of work in Northern mills and foundries. It is characteristic of the race to be more amenable to regulations established by those who assume authority over them, and they will probably for a long time be free from the influence which trade unions exert. Moreover, the prejudice existing among white workingmen against receiving negroes into their societies will operate for a long time as a barrier to effective work in the line of labor agitation and organization in that direction.

The claim is made by those who have studied this matter that the negroes drink less and are much steadier than the white men who generally work in rolling-mills and foundries. This will be disputed and

indignantly resented by white workingmen. Those who make the assertion have probably generalized upon insufficient data. Rolling-mill and foundry workmen suffer by the indiscretions of some of their number, but long years of personal observation of the habits of both these classes of toilers have convinced us that they are not generally addicted to the use of ardent spirits. Yet this is often alleged against them as a peculiar characteristic, inseparably connected with the manufacture or manipulation of iron. The many have to bear the odium of the bad habits of the few. It is not possible that in this respect negro workmen would prove themselves better than white men.

The assertion is made by Southern employers that a rolling-mill or a foundry can be run with negro labor on 60 per cent. of what it would cost to do the same work with white labor. This is probably true with some qualification. There are localities in the South in which white workingmen from the North have found it impossible to perform the full tasks to which they had been accustomed in their old locations. At the same rate of wages paid in the North, therefore, the cost of making iron would be increased on account of the smaller output. Negroes, being accustomed to the climate, could probably work harder than their white competitors, and thus decrease the cost. How much further this cost would be decreased in rolling-mills by the lower rates of wages paid to negroes has not been made plain, as the rates, if published, have not come under our observation. With regard to foundries, we have the assurance of D. M. Thomas, secretary of the National Association of Stove Manufacturers, that in a recent trip through the South he ascertained conclusively that labor costs have been very much reduced by the employment of negro hands in the stove-works.

A Southern correspondent who writes us on this subject adds that "nothing like mobism or interference with laborers at work is tolerated, but all men, both white and black, are protected." We are glad to have this assurance, which comes on good authority. He evidently alludes to the frequent occurrences during strikes in the North when mobs interpose to prevent those willing and anxious to work from securing employment in the establishment under ban. This condition of affairs is certainly very creditable to the South, but it may be doubted whether it can be perpetuated after great manufacturing communities are built up and thousands of workingmen are found where hundreds or probably only scores are employed to-day.

Probably no such outpouring of voluntary contributions for charitable purposes has been seen in this country since the Chicago fire in 1871 as that evoked by the late Johnstown catastrophe. The aggregate amount received from all sources for this purpose has considerably exceeded \$2,000,000 and may probably reach \$3,000,000. The calamity was so great in its proportions as to touch all hearts. Cities have vied with each other to see which could raise the largest amount, while corporations and individuals have responded most nobly to the call for relief from the suddenly distressed people of that terribly

stricken city. The iron and steel and hardware interests have been prominently liberal in their contributions, recognizing a special claim on them through the long identification of Johnstown with the iron and steel trades.

## Retaliation vs. Reciprocity.

With so much of acrimonious discussion growing out of the fisheries dispute, the seizure of vessels and other measures of reprisal on either side, it is not strange that false impressions are gradually disseminated, all tending to mutual alienation rather than to any friendly outreaching in the direction of reciprocity, such as was formerly recognized in treaty relations between the United States and the Dominion. The ministerial organ of the Ottawa Government, the *Montreal Gazette*, comes forward with some spirit in reply to an alleged ill-founded attack by Joseph Nimmo, entitled "A Canadian Scheme of Aggression upon American Commerce," the substance of which is that the Canadian Pacific Railroad was built expressly to antagonize interests in the United States, with the ultimate aim of establishing upon this continent a strong government based upon monarchical principles. The *Gazette* pleads guilty as to the main charges in the indictment. The editor admits that "the Canadian Pacific was built to unite the four disconnected blocks of inhabited territory constituting the Dominion. Its chief aim, in connection with other legislation, was to cause these four sections of the Dominion to trade among themselves. It was their desire to suppress the growth in Canada of a sentiment favorable to annexation to the United States. They meant to have a line of military communication between the different parts of the Dominion. Their present, as their late, premier aims to build up on this continent a strong government based upon monarchical principles, in close union with that of Great Britain." While conceding these points, it is broadly intimated that these matters particularly concern the people of the Dominion, and no others. Nor is there anything in the recital, in the opinion of the editor, that constitutes a grievance against Canada, or that warrants the "initiation of hostile legislation by the United States or of discriminatory regulations by its Government." The special reference here is doubtless to the proposition to bond Canadian cars crossing the boundary, respecting which it may be remarked that no measures of this character are likely to be enforced; certainly not without further action on the part of Congress. It is manifest that there would be two parties in such a contest, and that the vantage-ground would not be altogether on one side.

The ministerial organ endeavors to give this consideration due weight. We quote: "In Manitoba the Northern Pacific has entered the territory of Canada, has received public aid for so doing, and has begun a process of extension through the chief traffic-producing districts of the Canadian Northwest in direct competition with Canadian roads, and, it is now stated, contemplates building a line from Winnipeg to the Pacific Coast, to intensify the competition. In Eastern Canada, too, there are instances of United States railroads pushing their way into the Domin-

ion's territory. The Central Vermont for years operated lines of railroad in the Eastern townships. A Maine company now control the Passumpsic road and draw to New England traffic that would otherwise naturally come to Montreal. In Ontario the Vanderbilts own a railroad between the Detroit and Niagara frontiers, to carry United States freight across Canada to United States seaports—a Western duplicate of the Canadian Pacific's main line, which is to carry Canadian traffic across United States territory to Canadian ocean points. On the New Brunswick frontier United States roads cross the boundary line and return to their own territory as convenience of construction dictates, and are accorded all necessary facilities by the Canadian Government as a matter of course."

Ordinary fairness requires that the questions at issue should sometimes be contemplated from the Canadian point of view, before the public mind becomes unconsciously perverted, lest it happen that alleged grievances prove to be more fictitious than real and friendly relations become rudely shocked with no adequate cause. Especially is it needful to guard against the intrigues and perversions of men identified with rival projects who may hope to profit by excluding Canadian competition. The latest nightmare engendered by a heated public sentiment is that which grows out of the question of jurisdiction in Behring Sea, attended with the mustering of naval forces within the disputed area, rather than a resort to diplomacy. In a review of the situation it becomes obvious that constant agitation of irritating questions between nations, as between individuals, is consummate folly, and more heinous in proportion to the magnitude of the interests involved. Moreover, the old maxim *audi alteram partem* holds good always.

#### The First Year of Emancipation in Brazil.

While Dom Pedro II was sick in Europe the Princess-Regent, by decree of May 18 last year, liberated all the slaves in Brazil. There were a good many misgivings in and out of Brazil about the immediate result of this sudden partial disorganization of labor, but fortunately the apprehensions then entertained were not realized. The majority of new freedmen continued work on the plantations, lazily, it is true, and to some extent negligently, so that the coffee, for example, was in the main not picked carefully enough. Still, the crop being superabundant in 1888 and prices high, yielded planters a brilliant return. This year the crop is quite short, and there is again much fault found with the quality, the lessened yield arising from bad weather during blossoming, but prices have remained high and the planters have little cause for complaint. The two crops taken together amounted to 11,000,000 bags. The sugar crop of 1888 showed a deficiency of 90,000 tons as compared with 1887, but the latter year had witnessed an unusually large production (350,000 tons), and since then prices have risen 50 per cent., so that even the sugar planters have been doing well. India rubber has for a couple of months past also been steadily rising, while since 1878, when the crop

amounted to 7598 tons, its yield has doubled. In other words, the three leading products which Brazil exports have been and are still bringing such handsome prices in the world's markets that, in spite of some short-comings that may be traced back to partially disorganized labor during the twelvemonth following emancipation, the planters have so far not felt very seriously the loss of their slaves from a financial point of view. The fact is that the banks, which during slavery times had been in the habit of advancing money to planters on their growing crops and on mortgages on their estates, including the slaves, have been a great deal more affected by the liberation of the latter than the planters, and so are many dealers. A correspondent of one of our daily papers expresses himself on this subject as follows:

The planters, realizing that under existing circumstances, without the necessary slave labor (to say nothing of the pecuniary loss already sustained), they could not hope to meet their obligations, and they had in many cases received more money upon the mortgages than they could now realize by the sale of the plantations, allowed the mortgagee to foreclose and buy in. The direct result of this was that the banks were in danger of becoming short of money, and were loaded up with property which, for the time at least, would be nearly worthless, and as a further sequence to the foregoing, the planters are making use of the loss of their property as an excuse for non-payment of the merchants' claims upon them, and this last class are in their turn the sufferers; commerce, as a direct result, is beginning to feel the strain, and the present year will undoubtedly show a decided falling off in both exports and imports. The mere fact that Brazil is not at this moment in actual rebellion, but is, on the contrary, submitting to this sudden sweeping away of property, and submitting to the inconvenience and suffering entailed, speaks volumes for the patience and good sense of the people. The Government, realizing the condition of the planters and the great importance of rendering them all the assistance in its power, proposed, among other plans for this purpose, the establishment of a special class of banking institutions, which were to have, among other powers granted them, that of being allowed to issue a prescribed amount of their paper over and above their regular capital, which was to be guaranteed and secured by real estate mortgaged to the bank issuing the paper. Some scheme involving Government aid is, beyond doubt, necessary if this most important industry of Brazil (coffee-planting) is to recover and again assume its former position among the exports of the country, and to this end the Government will doubtless bend all its energies.

Yet while it may be a matter of comparative ease to relieve the monetary strain superinduced by the act of emancipation, it is a vastly more difficult matter to provide the necessary physical aid the coffee-planter requires, unless the tide of immigration now setting toward the country solves the problem and a higher class of laborers takes the place of the former slaves. If this, happily for Brazil, should prove to be the case, the planters of the southern portion will sooner recover from the deadlock caused by the emancipation act, and avail themselves of this new aid to cultivation, than the middle and northern sections of the country. Santos, the chief port of this section, will more than ever be the main shipping port for coffee, and Rio de Janeiro take a step back as a place of export for this article.

Brazil received a large immigration last year from Southern Europe, the bulk of it coming from Italy, some 120,000 landing at Rio and Santos, and this year probably a similar number will be added to the population. The planters of the chief coffee districts took immediate steps in that direction last summer, and the Govern-

ment subsequently did the same. Chinese coolies are not wanted, but Pernambuco and Bahia may eventually procure coolies from British India for the sugar estates, although the central sugar-house system of production, with improved processes of manufacture and portable plantation railways, will enable the planters to get along with less manual help than the old methods, as Cuba and Louisiana have both abundantly proved.

The planters, however, are clamoring for indemnity for the loss of their slaves, and the banks and dealers in the interior politically support them in their demands, and something will have to be done. Parliament opened on May 4, and the complete denial of compensation to the planters on the part of the John Alpedo cabinet of liberals has thrown the old conservatives into opposition and induced a host of planters to adopt republicanism. A cabinet crisis was thus produced, and the matter submitted to Dom Pedro II, who, on June 8, as per cable, has ordered Senhor Celso to form a new liberal cabinet, whose task will be to bring about a reasonable compromise, and compensate the planters by an issue of new Government bonds. As at no other time have Brazilian finances been in as flourishing condition as at present, nor the credit of the Government in London so high, there will be no difficulty in getting this threatening agitation out of the way.

Our people take a greater interest just now in all that concerns the countries south of us than at any previous time, and will be glad to see the Brazilians overcome the difficulties with which they are contending without serious civil disturbances. The trade we are doing with Brazil has reached huge proportions, and our domestic export thither promises well now that the consumptive capabilities of that country are rapidly on the increase. It compared last year with that of 1887 as follows:

Calendar year.	Imports from Brazil.	Exports to Brazil.
1888.....	\$55,259,228	\$8,100,538
1887.....	56,377,719	7,108,845

The decrease in imports from Brazil thus shown is immaterial as compared with the increase in our exports thither, which amounted to \$1,056,678, or 16 per cent. of the total exports in that direction in 1887.

#### A Coloring of the Steam Jet.

Some valuable notes are contributed to "Wiedemann's Annalen" by Von Helmholtz on the phenomena of the steam jet. He noticed that a jet of steam escaping from a hole of 1 or 2 millimeters diameter, lighted obliquely and observed upon a black background, is invisible at the lower extremity, and presents toward the top the well-known whitish appearance. (We may say in parentheses that a series of illustrations given in the work on steam issued by the Babcock & Wilcox Company, of this city, contains several illustrations which clearly show this feature of the steam jet.) He discovered that this aspect could be modified in many ways. The jet takes an azure blue when an electrified point is brought near the steam, and the color varies according to the power of the electrical machine to purple, red, yellow, green, &c., these tints being intimately connected with the dimensions of the liquid drops, and hence

it follows that the electrical point has the power of provoking condensation of the supersaturated vapor which is found at the lower part of the jet. The same result is obtained by bringing near to the steam jet a platinum wire made incandescent by the electric current, or silver, iron, copper or brass wires simply made red-hot in a flame, or even glass heated below the red, or an organic matter, wood, paper, &c., in a state of slow combustion. The products of any flame whatever, with the exception of the flame of pure alcohol, directed upon the jet of steam by the aid of a chimney or by simply blowing produce a very energetic effect. The same modification is also caused when traces of certain chemical substances are introduced into the jet. It is known that solid dust particles provoke the condensation of super-saturated vapors, but their presence cannot be invoked here to explain the preceding facts. Helmholtz believes that it may be attributed to a molecular concussion, the effect of which may be compared to that of mechanical concussion upon superheated or super-saturated liquids. A flame, for example, is the scene of closely approximated and extremely varied movements, and the chemical atoms which are incessantly passing in it from one combination to another are found in every kind of unstable condition. These movements and changeful states of combustion leave their traces in the products of combustion at a certain distance from the flame properly so called, and determine the observed phenomena. The luminous effect produced at the extremity of an electrified point and the presence of ozone in its vicinity show that this point is the cause of concussions comparable to those provoked by active combustion, and the analogy between the two phenomena is found again in the fact that they both furnish means for making electricity pass through gas. Regarding incandescent bodies, they can act either through the emission of solid particles from their surfaces or by the chemical concussions which they communicate to the surrounding gases.

### The Sparrow's Point Furnaces.

A letter to the *Steelton Reporter* from Sparrow's Point, Md., contains the following information concerning the new furnaces of the Pennsylvania Steel Company at that place:

Furnace A could easily be ready to be touched off within a week, but it will hardly have the fires lighted before September 1. The delay is caused by the incomplete state of some arrangements which affect its operation. Furnace B could be completed within a month, but considerably more time will be taken to put it in readiness for its appointed work. The large engine for Furnace A was tested recently at both high and low pressure, and the result was satisfactory in every way. The engines for Furnaces B and C will be tested within a week, and it is expected that all four of the engines will be ready for action within one month. The boilers and pumps are all in position and ready to begin their long term of service. The tunnel, which forms part of the conduit through which cooling water will be brought from the river to the plant, has been completed a good while; the dredger is engaged on the last piece of work, and in about one month this part of the work will be completed. The large stock-house is completed, except the roof, which is not all put on as yet. The casting-houses for Furnaces C and D are about half com-

pleted. The columns for Furnace C are up, and workmen have begun building up the furnace shell. The four large hot-air ovens for Furnace C are finished and are ready for the work they are intended for. Two of the four ovens for Furnace D are also finished, and the remaining two are about half-way up. The draft stack, 245 feet high, for Furnaces C and D is within a few feet of completion. It is a counterpart of the one already erected for Furnaces A and B. The trestle-work in the stock-house of Furnaces A and B is completed, and the tracks have been laid on it all the way. A scale siding of over a mile in length has been built along the Baltimore and Sparrow's Point Railroad, and a large scale-house has been erected.

### The Blast-Furnaces on June 1.

The production of pig-iron shrinks from month to month, but the falling off is not so great as would be supposed. Our reports show that the output is still very heavy, when the condition of the trade is taken into consideration. At the same time a distinctly hopeful feeling characterizes the communications we have received from the furnace men. Many of them report diminishing stocks and increasing inquiries. Others state that they are refusing to quote on business offered them, which would cover a large part of the next twelve months. The condition of all the furnaces in the country on June 1, as compared with May 1, was as follows:

	Total stacks.	In blast.	Capacity per week.	Out of blast.	Capacity per week.
June 1. 545	286	187,119	239	73,856	
May 1. 545	286	144,843	249	64,762	

The condition of the anthracite furnaces in the several geographical divisions was as follows on the 1st of the current month:

### Anthracite Furnaces June 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	28	11	3,697	12	3,841
New Jersey.....	14	4	1,897	10	8,604
Spiegel.....	3	3	218	0	0
Pennsylvania:					
Lehigh Valley....	46	23	8,280	23	8,288
Spiegel.....	1	1	75	0	0
Schuylkill Valley..	32	15	5,522	17	4,631
U. S. Susquehanna Valley.....	17	10	3,484	7	998
Lebanon Valley....	16	14	7,173	2	608
L. Susquehanna Valley.....	21	10	4,020	11	2,788
Totals.....	173	91	34,386	82	24,728

For a year past our records show the following:

	Furnaces in blast.	Capacity per week.
June 1.....	91	34,386
May 1.....	95	35,315
April 1.....	102	37,977
March 1.....	103	37,987
February 1.....	107	39,187
January 1, 1889.....	107	39,728
December 1, 1888.....	99	34,879
November 1.....	95	38,645
October 1.....	95	38,728
September 1.....	92	38,541
August 1.....	96	38,897
July 1.....	92	32,478
June 1.....	99	32,418

It will be observed from this table that the capacity of the anthracite furnaces in blast is still in excess of that of a year since. The changes which have occurred within the past month are unimportant. The New York furnaces maintain their former status. In New Jersey the Warren Furnace was blown out. In the Lehigh Valley one Glendon stack was blown out and one Thomas stack was blown in. One of the Saucon furnaces of the Thomas Iron Company is now out for repairs after a very successful run of nearly four years. In the Schuylkill Valley the Warwick has been blown out for repairs, after having

made a very satisfactory blast in every respect. Mount Laurel has been banked. One of the Montour furnaces has been blown in on the Upper Susquehanna, and one of the Colebrook stacks at Lebanon. In these two districts an increased production will result.

The coke furnaces exhibit the heaviest decline in production, as was naturally to be expected. The reduction in output amounts to about 6000 tons per week. The following table shows the condition of the coke furnaces on the 1st of the present month.

### Coke Furnaces June 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	3	1	1,127	2	2,250
Pennsylvania:					
Pittsburgh district.....	19	17	30,553	2	1,996
Spiegel.....	1	0	0	1	539
Shenango Valley....	19	15	10,773	4	2,156
Juniata and Conemaugh valleys.	18	7	1,425	11	6,585
Spiegel.....	1	0	0	1	430
Youghl. Valley....	5	4	1,622	1	730
Miscellaneous.....	4	3	1,686	1	650
Maryland.....	1	0	0	1	179
West Virginia.....	6	3	2,418	3	488
Ohio:					
Mahoning Valley..	14	10	7,900	4	2,538
Central and Northern.	16	11	7,706	5	3,764
Hooking Valley....	14	3	1,079	11	3,563
Hanging Rock.....	18	6	1,720	7	1,410
Indiana.....	2	0	0	2	389
Illinois.....	12	7	8,070	5	3,935
Spiegel.....	1	1	483	0	0
Wisconsin.....	4	2	1,000	2	850
Missouri.....	6	2	1,094	4	2,318
Colorado.....	2	0	0	2	940
The South:					
Virginia.....	12	9	4,187	3	1,180
Kentucky.....	4	3	887	1	230
Alabama.....	26	21	13,278	5	3,262
Tennessee.....	11	9	4,382	2	790
Georgia.....	2	1	501	1	310
Totals.....	216	135	91,771	81	40,374

As compared with previous months the furnaces in blast show the following record:

	Furnaces in blast.	Capacity per week.
June 1.....	135	91,771
May 1.....	147	98,399
April 1.....	151	100,060
March 1.....	150	100,737
February 1.....	150	98,513
January 1, 1889.....	157	108,736
December 1, 1888.....	151	101,748
November 1.....	146	94,696
October 1.....	137	85,461
September 1.....	133	81,082
August 1.....	122	74,855
July 1.....	21	69,543

The most important changes made in connection with the coke furnaces relate to those of the Conemaugh Valley. The furnaces of the Cambria Iron Company, at Johnstown, are banked at present owing to the recent disastrous flood, which prevents them from receiving their supply of coke. These furnaces suffered no damage, but will be at work shortly. Other coke furnaces in various parts of the country have also had their production curtailed by the interruption of railroad communication in Central Pennsylvania, which cut off their coke supply.

The first day of the present month found three idle blast-furnaces in Allegheny County out of a total of 20 stacks, a larger number than have been idle at one time for some months. These three idle stacks are Furnace A, of Carnegie Bros. & Co., Limited; Lucy No. 1, of the same firm, and No. 1 stack of Shoenberger & Co. The first-named stack was blown out on May 11 for repairs, and will probably be ready for blast during the present month. The Lucy stack was blown out on May 7 for relining and general repairs. It has had a long and very successful blast, and will be blown in again as soon as possible. Shoenberger stack No. 1 was banked on May 25 for repairs and will be ready for blast about the 15th inst. As will be noticed, we have increased the number of stacks credited to Allegheny County from 19 to



20. This has been made necessary by the fact that the new stack of Laughlins & Co., which has been in process of erection for some months, has been completed and put in blast. This firm have now three stacks in operation, two of which have a capacity of about 225 tons per day each, while the third has a capacity of 75 tons per day, making a total productive capacity for this firm of over 500 tons per day. The new stack of the Carrie Furnace Company is rapidly approaching completion, and in all probability will be blown in early in the next month. When this takes place the blast-furnaces of Allegheny County will have a capacity for producing about 1,200,000 gross tons of pig-iron per year, or about one-sixth of the whole amount made last year in the entire country. At present the Carrie Furnace Company have one stack in blast, which is making about 125 tons per day. Clinton Furnace, which is being operated by a syndicate of creditors of Graff, Bennett & Co., is producing from 45 to 50 tons per day. This is one of the oldest active coke furnaces in Pennsylvania, having been erected in 1859. Carnegie Bros. & Co., Limited, have seven stacks at Braddock, six of which are in blast, five of them on Bessemer and the other one on spiegel. Edith Furnace, operated by the Edith Furnace Company, in Allegheny City, is in successful blast, and is turning out about 3500 tons per month. The two stacks of the Isabella Furnace Company at Etna are turning out more iron than ever before in their history. The two Shoenberger stacks are comparatively small, and make about 5250 tons per month. The new Soho Furnace, of the Moorhead-McCleane Company, which was blown in on November 15 of last year, has been making an excellent record for a new furnace. For the month of May just closed it produced 5860 gross tons of pig-iron. From present indications the output of pig-iron in Allegheny County for the present year will be the largest in its history.

Among the coke furnaces in other districts but little worthy of note has occurred. Bellefonte, in Center County, Pa., has blown out, as also has Vernon, in the Shenango Valley. Kemble was banked on the 14th. In Maryland Catoclin has ceased production for the present. In Virginia the rebuilt Longdale has been blown in and the large Victoria is expected to be in operation by the 25th inst. In Ohio the Zanesville, Grafton, Akron and Winona are out, while the Franklin and Fannie have been blown in. Vigo, in Indiana, is being rebuilt. All four of the Ensley furnaces in Alabama are now in operation, and the Williamson Furnace has also been put in blast.

The condition of the charcoal furnaces of the country was as follows at the beginning of the month:

Charcoal Furnaces June 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	7	580	7	580
New York.....	10	3	412	7	520
Pennsylvania.....	23	3	210	20	849
Maryland.....	8	4	400	4	165
Virginia.....	28	4	250	19	696
West Virginia.....	3	0	0	3	165
Ohio.....	13	7	334	6	291
Kentucky.....	2	1	120	1	100
North Carolina.....	2	1	70	1	70
Tennessee.....	8	4	1,131	4	500
Georgia.....	2	0	0	2	114
Alabama.....	9	9	1,798	0	0
Michigan.....	25	9	3,061	16	3,930
Missouri.....	3	2	596	1	213
Wisconsin.....	7	3	1,411	4	491
Texas.....	1	1	173	0	0
California.....	1	0	0	1	120
Washington.....	1	1	175	0	0
Oregon.....	1	1	181	0	0
Totals.....	156	80	10,962	96	8,754

As will be seen by the following table, the charcoal iron production has changed very slightly for some time:

	Furnaces in blast.	Capacity per week.
June 1.....	60	10,962
May 1.....	54	10,629
April 1.....	53	10,173
March 1.....	55	11,031
Feb. 1.....	62	11,219
Jan. 1.....	67	11,946
Dec. 1.....	71	12,286
Nov. 1.....	73	12,724
Oct. 1.....	71	11,619
Sept. 1.....	67	11,243

The Muirkirk Furnace, in Maryland, has been blown in, also Walton, in Virginia, and Jefferson, in Ohio. In Michigan the Detroit and Newberry are both out, while one of the Fayette stacks has been blown in; the second Eureka stack is out. The Minneapolis Furnace, in Wisconsin, is doing good work. Although rated as a 60-ton furnace, in 6 days and 18 hours in the last week of May 570 tons were made, the output for the 30th being 88 gross tons and for the 31st 94½ tons, on an average of 84½ bushels of charcoal. In Missouri the Sligo Furnace has again been started.

## CORRESPONDENCE.

### The Silver Question.

To the Editor:—Replying to an article on the silver question in your issue of May 23, 1889, I wish to say that the bullion product of the United States is principally confined to the States and Territories west of the Missouri River. Wells, Fargo & Co.'s report for the year 1888 shows aggregate products as follows: Gold, \$29,987,702; silver, \$53,152,747. These two metals are closely associated together, very little gold being found without a proportion of silver and very little silver without a proportion of gold, and it is not the intention of the people of this nation to favor the gold miner more than the silver miner. They are as closely associated together as the two metals, therefore, it is the intention of the silver kings like Senator Stewart, of Nevada, to degrade gold, but to elevate silver and place it in the rank where it belongs, adopting the bimetallic law, permitting each and every one to pay at will in gold or silver. Then dealers in money will give up searching for the metal which is hard to find and seek for that which is plentiful, to have it coined if each person is everywhere free to coin gold and silver alike, as it is mined, at the standard of 25.8 grains of gold to the dollar and 412.5 grains of silver to the dollar. This fixity of the relative value between the two metals can be obtained without infringing on the liberty of the individual, because the legally granted option to pay in gold or silver does not preclude stipulations being made in contract for exclusive payments to be made in either metal, if Congress would allow the public to get silver dollars coined in the Federal mints (which they have been taxed to build), or in other words, if the United States would return to the bimetallic régime founded by Alexander Hamilton (the first Secretary of the Treasury). He proposed that no preference should be given to either gold or silver. The founders of the Constitution of this Republic did not intend that one section or one class of producers should meet with more favor than another; therefore, we believe that the silver producer is unjustly treated by the wealth consumers under the provisions of the Constitution.

The fraudulent trick is explained as follows: The Government, under the Bland act, purchased for the year 1888 \$24,000,000 worth of silver bullion to be coined. This amount, at an average of 93 cents per ounce, would purchase at coining value \$38,365,161 worth of bullion, thus making a profit off of the producer of \$9,365,161.

China purchased for the same period \$14,621,431 at coining value, but pays for it at 93 cents per ounce, thus paying only \$10,517,927 for it, and making a profit off of the producer of \$4,104,043. Deducting these amounts from the total product would leave \$5,166,155 coining value in unsold bullion to be used in the arts which is useful only to the wealth consumers, the wealth producers not being able to purchase it after standing the enormous discounts in favor of the consumers. This amount at 93 cents per ounce would be worth \$3,766,083, making a loss of \$1,450,073 to the producer. The trick exposed is as follows: Profit to the Government for stamping \$24,000,000 worth of bullion, \$9,365,161; loss to producers on China purchase, \$3,104,043; discounts on balance unsold, \$1,450,073; total discounts to silver producers, \$14,919,277 out of the \$53,152,747 mined in 1888. There are hundreds of troublesome mortgages and the like on this coast that \$14,919,277 annually would be no small sum toward paying off. Besides, there are now thousands of miners out of employment and hundreds of mines idle that the discount on silver would pay the expense of operation, but with both expense and discounts to pay they cannot operate. This also has a bad effect on the farmer, merchant and producers of all commodities. If the silver-bullion producer could exchange his bars of bullion at the mints for silver as the gold producer can the Treasury would not be filled to overflow. There would be no silver-barricade of \$323,000,000, as every silver-bullion producer would then be an agent to circulate silver, and there is not a miner, merchant or producer in the land that would refuse to accept payment in silver, and there would be thousands of homes made happy that are now in want. The political possibility is of importance, and unless some relief is had in the near future it may be summed up as follows: At the next national leap-year party held in Chicago the California delegation will not only be solid, but they will be joined by every bullion-producing State west of the Missouri River, and their battle-cry will be for President Hon. W. M. Stewart, of Nevada. Those leap-year party pledges are getting too common. This coast is as much of a unit on the silver question as it has been on the Chinese question, and with Senator Stewart for the national standard-bearer in 1892 this coast will feel that it has entered on a new era of prosperity. Yours respectfully,

E. T. HALE.

SAN FRANCISCO, CAL., June 3, 1889.

The first students in the Cleveland, Ohio, Manual Training School have finished their course and graduated. The annual report to the corporate members says two of the students who are also members of the high school determined to try the experiment of a post-graduate course, the work of which should be the construction of a 3 horse-power steam-engine by each pupil. The result of the experiment has been satisfactory in many ways, as it has shown that the pupils can apply what they learn, that they are interested in their work, and that they can work much more rapidly than would be supposed by judging from their former work, where some new difficulty had to be overcome at every step. Both of the engines will be running by the end of the term.

It is supposed that the steam-power now utilized is almost equivalent to the hand labor of the whole population of the world. Its actual amount is estimated at 46,000,000 horse-power. The United States heads the list with 7,500,000 and Great Britain comes next with 7,000,000. Among other nations Germany has 4,000,000, France 3,000,000 and Austria-Hungary 1,500,000.

## Mineral Productions of the United States.

Advance sheets of the report of David T. Day, Chief of the Division of Mining Statistics and Technology, U. S. Geological Survey, on the metal and mineral productions of the United States for the calendar year 1888, make a very remarkable showing. In the report for 1887 Professor Day said that nearly every mineral industry showed an increase over previous years, and that the tremendous aggregate estimated value of mineral products for the year, \$542,284,225, was the largest total ever reached by the mineral industries of any country. He attributed the immense production to exceptional conditions in important industries, and expressed the opinion that the aggregate shown for the year 1887 would not be equaled in 1888. The advance sheets of his report for 1888, however, show that this expectation was not confirmed, and that the total production for the year again showed a large increase, exceeding the aggregate for 1887 by nearly \$50,000,000. The comparison of totals for a series of years, according to the Geological Survey reports, is as follows:

### Aggregate Metal and Mineral Production of the United States.

1882.....	\$456,165,490	1886.....	\$465,327,888
1883.....	453,240,748	1887.....	542,284,225
1884.....	418,476,748	1888.....	591,650,961
1885.....	428,713,909		

The increase since 1884 is indeed remarkable, three successive years showing an increase over the year preceding by \$37,000,000, \$77,000,000 and \$50,000,000 respectively, and the production of 1888 exceeding that of 1884 by \$178,000,000.

The comparison of production of metals for 1888 and 1887 shows that the output of copper was increased by artificial stimulation nearly enough to offset the reduced value of the product of pig-iron, while gold production was unchanged, and silver, lead and zinc increased, making an excess of \$6,000,000 in the yield of metals compared with the previous year. The main item in the comparison of the two years is of course the immense coal product, exceeding in 1888 the production of 1887 by nearly \$30,000,000. Besides these great items, an increase is noted in the production of petroleum, natural gas, and a long list of minerals. The only item in which a material reduction in the value of the year's production is recorded is pig-iron, and in this the quantity produced was greater than in 1887. The details of the production of the more important minerals are as follows:

### METALS.

**Iron and Steel.**—The principal statistics for 1888 were: Domestic iron ore consumed about 12,060,000 long tons. This is an increase over 1887 of 760,000 tons. Imported iron ore consumed 587,470 long tons. Total iron ore consumed in 1888, about 12,650,000 long tons, or 150,000 tons more than in 1887. Pig-iron made in 1888, 6,489,738 long tons. This is an increase over 1887 of 72,590 tons. Steel of all kinds produced in 1888, 2,899,440 long tons. This is a decrease from 1887 of 489,681 tons. Limestone used as a flux in the manufacture of pig-iron in 1888, about 5,438,000 long tons.

**Gold and Silver.**—According to the Director of the Mint the gold product was 1,604,927 fine ounces, valued at \$33,175,000. This is about the same as in 1887, being an excess of only \$75,000. The silver product was 45,783,682 fine ounces, of the commercial value of about \$43,000,000 and of the coining value of \$59,195,000. This is an increase of 4,515,327 ounces over the product in 1887. In addition to the product of our own

mines some 10,000,000 ounces of silver were extracted in the United States from foreign ores and bullion.

**Copper.**—The total product, including the yield of imported ores, increased to 281,270,622 pounds, or 115,635 short tons, during 1888, which is 46,053,291 pounds more than the product of 1887. During the first quarter of 1889 the production was increasing at even a more rapid rate. The prices received by American producers averaged 15½ cents per pound for lake copper, 14½ for Arizona and 14 for other districts, making the total value \$33,833,954. Montana led in the production, making 97,897,968 pounds. Consumption was somewhat reduced by the high prices.

**Lead.**—The product increased to 180,555 short tons from 160,700 tons in 1887. The increase was due principally to the heavier receipts of lead in Mexican silver-lead ores from 15,000 tons in 1887 to over 27,000 in 1888. The average price in New York was 4.41 cents per pound. The production of white lead, chiefly from pig-lead, was 89,000 short tons, valued at \$10,680,000.

**Zinc.**—The erection of new works and the extension of old ones led to a further notable increase in the production of zinc in 1888. The additions to capacity were fairly uniformly distributed in the West, East and South. Production in 1888, 55,908 short tons; in 1887, 50,340 tons. The production of zinc white in 1888, directly from ores, was 20,000 short tons, worth \$1,600,000.

**Quicksilver.**—The product was 33,250 flasks (of 7½ pounds each) from California, a decline in that State of 510 flasks from 1887 in spite of a very satisfactory price, which averaged \$42.50 per flask, making the total value \$1,413,125. No new valuable deposits were discovered in 1888, and without them it is not probable that the yield of quicksilver will increase.

**Nickel.**—The industry remains unchanged except for indications of further developments at Lovelock in Nevada and Riddle, Oregon. The product includes 190,637 pounds of metallic nickel, valued at \$114,882 at 60 cents per pound, and 4545 pounds, worth \$1136, exported in ores and matte.

**Cobalt Oxide.**—The total product, including the contents of the exported ores and matte, was 12,266 pounds, worth \$18,441. In 1887 the total was 18,340 pounds, worth \$18,774, the lower rate of value in that year resulting from a larger proportion of exported nickel in matte and ore.

**Chromium.**—The product declined from 8000 tons in 1887 to 1500 tons in 1888. The average price in San Francisco remained \$15 per ton. Increased operations are probable in 1889.

**Manganese.**—The product of manganese and manganiferous iron ores in the United States in 1888 was 239,460 tons, valued at \$276,215. Of this amount some 25,500 tons would be classed as manganese ores; remainder as manganiferous iron ores. Of the manganiferous iron ores 11,462 tons averaging 11 per cent. of manganese and 189,574 tons averaging 4 per cent. of manganese were from the Colby Mine, Michigan. In addition to the above, some 60,000 tons of argenterous manganese ores, valued at \$10 a ton, chiefly for the silver contained in them, were produced in the Rocky Mountain region.

**Aluminium.**—The past year was more promising than ever before for the production of cheap aluminium. The production of metallic aluminium as an industry distinct from the production of alloys began toward the close of the year, and 500 pounds had been made up to December 31; the production of 3000 pounds since then indicates that the industry may continue. The exact amount of alloys produced by the Cowles process has not been furnished, but was not markedly different from the

product of 1887, when 18,000 pounds of aluminium contained in bronze and ferro aluminium were produced. The price for metallic aluminium declined to as low as \$4.50 per pound for less favored brands.

**Platinum.**—Including the platinum and iridium separated from gold by the assay offices and that saved in placer gold mining the product was about 500 ounces, valued at \$2000.

### FUELS.

**Coal.**—The total production of all kinds of commercial coal in 1888 was 142,037,735 short tons; increase over 1887, 18,022,480 tons. This may be divided into Pennsylvania anthracite, 43,922,897 short tons (increase, 4,416,642 short tons), or 39,216,872 long tons; all other coals, including bituminous, brown coal, lignite, small lots of anthracite produced in Colorado and Arkansas, and 4000 tons of graphitic coal mined in Rhode Island, amounted in the aggregate to 98,114,838 short tons; increase, 13,605,838 tons.

**Coke.**—The production of coke in the United States in 1888 was 8,527,560 tons. Pennsylvania produced by far the largest amount, the Connellsville region alone producing 4,855,553 tons; West Virginia, 528,583 tons; Alabama, 518,511 tons; Tennessee, 385,693 tons, and Virginia, 149,099 tons.

**Petroleum.**—The product of petroleum in the United States in 1888 was 27,846,018 barrels (of 42 gallons each), valued at about \$24,598,559. Of this amount Pennsylvania produced 16,491,088 barrels; Ohio, 10,010,868 barrels; West Virginia, 119,448 barrels; California, 704,619 barrels, and other States 20,000 barrels.

**Natural Gas.**—The amount of natural gas consumed is given in coal displacement—that is, the amount of coal displaced by the use of natural gas. It is estimated that the amount of coal displaced by natural gas in the United States in 1888 was 14,163,880 tons, valued at \$22,662,128. Of this amount 12,548,830 tons were displaced in Pennsylvania, 750,000 tons in Ohio and 660,000 tons in Indiana.

### STRUCTURAL MATERIALS.

**Building Stone.**—Direct returns from producers of the various kinds of building stone show that there was but a small gain in value over the figures of 1887. The value of the stone produced in 1888 was \$25,500,000, or \$500,000 more than in the preceding year.

**Brick and Tile.**—Value, \$48,213,000. This figure represents only a small gain over 1887. This is due to increase in the number of manufacturing plants.

**Lime.**—The production is estimated at 49,087,000 barrels. These figures are not largely in advance of those for 1887.

**Cement.**—The amount of cement produced in 1888 was less than for 1887, being 6,253,295 barrels for 1888.

### ABRASIVE MATERIALS.

**Grindstones.**—Ohio and Michigan furnish practically all the sandstone from which grindstones are made. The product in 1888 increased slightly, 41,000 long tons being produced, against 37,400 in 1887.

**Corundum.**—Production is limited to the old mines in North Carolina and Georgia; 589 short tons, valued at \$91,620, were produced in 1888, against 600 tons in 1887.

**Oil-stones and Whetstones.**—The production of novaculite from Arkansas increased slightly, making the total, including Labrador oil-stone, &c., 1,500,000 pounds, valued at \$18,000 in the rough state.

### MISCELLANEOUS.

**Salt.**—The industry shows only slight changes. In 1888 the production was 8,055,881 barrels of 280 pounds. In 1887 the product was 8,003,962 barrels. Kansas became a commercial source of salt in 1888, producing 155,000 barrels, with a prospect of still greater increase in 1889.

**Borax.**—The production was restricted to 7,589,000 pounds. In 1887 the product was 11,000,000 pounds.

**Soapstone.**—Production about 15,000 tons, worth \$50,000 before shipment.

**Asphaltum.**—The production of 1888 included 700 tons of gilsonite mined in Utah; 3100 tons of ordinary asphaltum, principally from California, and 50,000 tons of bituminous rock, quarried in California for pavements in competition with asphaltum.

**Flint.**—For potters' use the consumption was 16,250 long tons. Including that for sand-paper and for glass, the consumption was about 30,000 tons.

**Mica.**—Owing principally to the use of smaller sizes in stoves, the production of sheet-mica decreased from 70,500 pounds in 1887 to 48,000 in 1888. There is increased demand for mica waste.

**Mineral Paints.**—The product, including ocher, metallic paints and small amounts of umber and sienna, increased to 24,000 long tons.

**Graphite.**—The production of pure graphite was limited to Ticonderoga, N. Y., and is reported as unchanged. The total production of pure material was 400,000 pounds. Small amounts of less pure material for foundry facings, &c., were produced in North Carolina and at Cranston, R. I.

**Fluorepar.**—The production, limited to the neighborhood of Roseclaire, Ill., and Evansville, Ind., is reported at 6000 tons, an increase of 1000 tons over 1887.

A comparison of values is made as follows:

#### Metallic Products.

	1888.	1887.
Pig-iron, spot value.....	\$107,000,000	\$121,226,800
Silver, coining value.....	59,196,000	58,441,300
Gold, coining value.....	33,175,000	33,100,000
Copper, value at N. Y. City	38,838,954	21,062,440
Lead, value at N. Y. City..	15,924,951	14,463,000
Zinc, value at N. Y. City..	5,500,855	4,782,300
Quicksilver, value at San Francisco.....	1,413,125	1,499,000
Nickel, value at Phila.....	115,513	133,200
Aluminum, value at Phil.	65,000	74,905
Antimony, value at San Francisco.....	20,000	15,500
Platinum, value (crude) at N. Y. City.....	2,000	1,808

Totals.....\$256,245,408 \$260,419,233

#### Non-Metallic Mineral Products (Spot Values).

	1888.	1887.
Bituminous coal.....	\$122,497,341	\$96,004,656
Pennsylvania anthracite..	30,020,483	34,552,181
Building stone.....	25,500,000	25,000,000
Lime.....	24,543,500	23,375,000
Petroleum.....	24,594,559	18,856,606
Natural gas.....	22,632,123	15,188,500
Cement.....	4,533,639	5,136,577
Salt.....	4,377,304	4,093,846
Limestone for iron flux...	2,719,000	3,226,200
S. Carolina phosphate rock	1,951,673	1,836,818
Zinc-white.....	1,600,000	1,440,000
Mineral waters.....	1,709,302	1,261,473
Borax.....	455,940	550,000
Gypsum.....	420,000	425,000
Manganese ore.....	255,000	333,844
Mineral paints.....	380,000	310,000
New Jersey marls.....	300,000	300,000
Pyrites.....	177,658	210,000
Flint.....	175,000	185,000
Mica.....	70,000	142,250
Corundum.....	91,620	108,000
Sulphur.....	.....	100,000
Precious stones.....	64,850	88,600
Gold quartz, souvenirs, jewelry, &c.....	75,000	75,000
Crude barytes.....	110,000	75,000
Bromine.....	95,230	61,717
Feldspar.....	50,000	56,100
Chrome iron ore.....	20,000	40,000
Graphite.....	33,000	34,000
Fluorspar.....	20,000	20,000
Slate ground as pigment..	25,000	20,000
Cobalt oxide.....	18,441	18,774
Novaesulite.....	18,000	16,000
Asphaltum.....	381,500	16,000
Asbestos.....	3,000	4,500
Rutile.....	3,000	3,000

Totals.....\$328,914,528 \$285,864,942

	1888.	1887.
Metals.....	\$256,245,408	\$260,419,233
Mineral substances named in the foregoing table..	328,914,528	285,864,942

Totals.....\$585,159,931 \$536,284,225

Estimated value of mineral products unspecified 6,500,000 6,000,000

Grand totals.....\$591,659,931 \$542,284,225

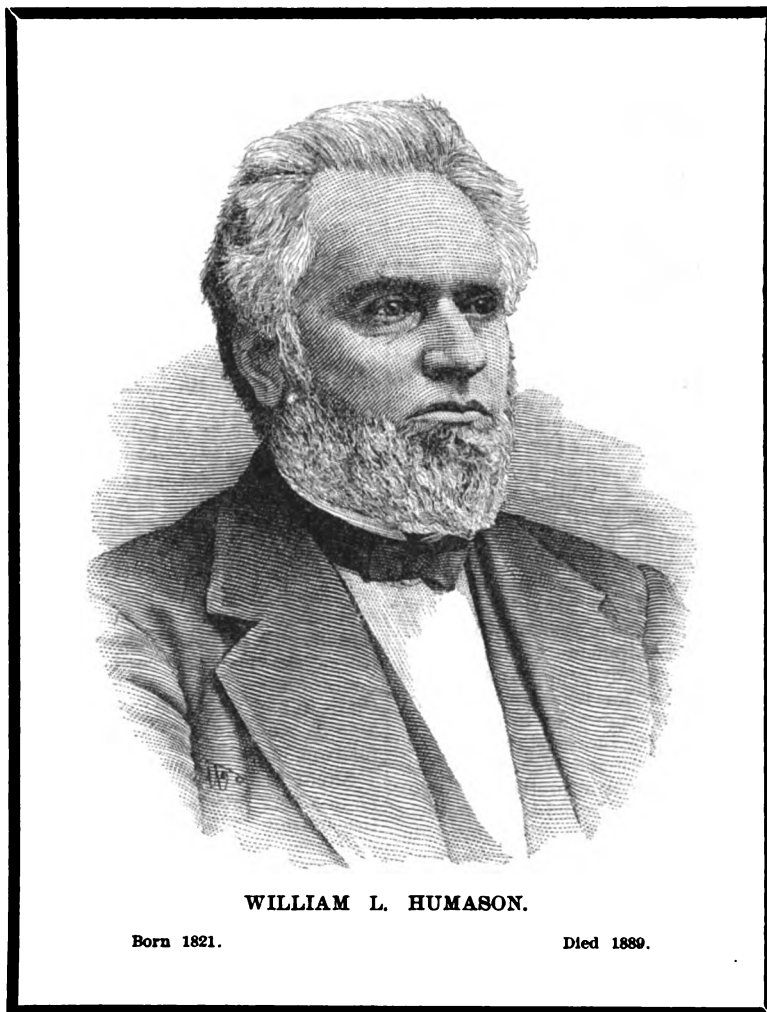
With the reduction of copper production to the normal demand, Professor Day says, a decline in the aggregate for 1889 will not be inconsistent with the natural develop-

ment of our mineral resources. This is clearly true. The immense production of 1887 and 1888 has been due to exceptional conditions in several industries which have now been changed. The tremendous production of fuels has been in part due to these unusual conditions affecting metals; but with all due allowance for abnormal influences, the record of a series of years shows a steady growth apart from all artificial stimulants and exceptional conditions, and indicates the continuance of this gradual expansion in many important directions in response to the increasing demands of consumption and the country's growth and development of resources.

#### William L. Humason.

William L. Humason, who was widely known to the Hardware trade as president of the Humason & Beckley Mfg. Com-

pany, New Britain, Conn., was born in Simsbury, Conn., January 10, 1821. In his early life he engaged in teaching and represented Simsbury in the State Legislature one year, but in 1857 he moved to New Britain, from which place he was also sent as representative to the Legislature for two years. In 1853 he established the Humason & Beckley Mfg. Company, who in 1863 were incorporated under the laws of the State of Connecticut. Of this company he remained the president until his death, which occurred April 15, 1889. By the death of Mr. Humason a number of institutions in New Britain were deprived of the excellent counsel and assistance which from his ability and position he had always rendered them. He was a director of the New Britain National Bank and of the New Britain Institute, having been identified with them from the time of their establishment. He was also an efficient member of the town board of education. He was a vestryman in St. Mark's Episcopal Church, in which he had also held various offices, and of which he was a valued member. He was also a charter member of the New Britain and Saturday Night Clubs, by whom suitable resolutions were adopted, showing the estimation in which he was held. While a careful and successful business man, Mr. Humason's tastes were of a literary nature, and he never parted with his early love for literary culture and employment, and was a fine reader and public speaker and a poet of more than ordinary ability. Many of his shorter poems have been published, but his longer ones, which were written for special occasions and delivered by him, he would never consent to have given to the public, although strongly urged to do so by his friends. As a business man Mr. Humason was held in estimation as of unquestioned integrity. As a friend he was genial and sincere, and as a citizen his influence was always on the side of order and right, and



WILLIAM L. HUMASON.

Born 1821.

Died 1889.

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In the Sabines district, Mexico, a new iron region has recently been discovered, according to a report in the *Iron and Steel Bulletin*. It seems to be very favorably situated, being well watered and contiguous to an extensive coal basin, which is surrounded by a chain of mountains of volcanic origin. These contain deposits of specular and hematite iron ore of great purity, and have only 0.004 per cent. of phosphorus. In this respect the ores are equal to the best of the Lake Superior district.

# TRADE REPORT.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., June 11, 1889.

**Pig-Iron.**—There has been a good deal of inquiry for Pig-Iron during the week, but the actual amount taken is not important. Buyers have had an idea that they could make their own prices, so that when sellers asked an advance it had a tendency to check the demand. But the requirements of consumers have forced some of them into the market at prices averaging from 25¢ to 50¢ per ton advance on last month's quotations. This, of course, does not refer to special brands, which were held at steady quotations when many others yielded 50¢ to \$1 per ton. Those who quoted \$14.50 for Gray Forge and \$16.50 for No. 1, for instance, are now firm at \$15 and \$17, with very little for sale at the new prices. As a matter of fact, the strongest feature in the market appears to be in the limited offerings. Regular customers are accommodated with moderate quantities, but there is no chance for parties who may desire to place orders for deliveries during the fall and winter months. From this it will be seen that there is a complete change in the character of the market. Instead of buyers dictating terms, sellers have full control, and govern themselves accordingly. There is no probability of any material advance in prices, but a gradual stiffening seems to be almost inevitable, as the movement includes every description of Iron and Steel. The usual asking prices for local brands are about \$15, delivered, for Gray Forge, \$16 @ \$16.50 for No. 2, and \$17 @ \$17.50 for No. 1. Very few would be willing to shade these prices, while some would either ask more money or not quote at all, as favorite brands are well sold up and command a premium of 50¢ to \$1 per ton. Southern Iron is held at slightly better prices, although \$14.50, \$15.50 and \$16.50, delivered in consumers' yards, would still be accepted for shipments within the next three months, but buyers appear somewhat indifferent unless for tried and approved brands. The average gain in prices during the week, however, is at least 25¢ per ton, and if Southern and Western markets do equally well it is a pretty sure thing that 25¢ more will be added before the close of another week. Everything depends on what the West may do, hence very conservative trading in the meantime.

**Blooms.**—The market is firm, and in most cases the extreme outside figures are demanded. Sales have not been specially heavy, as buyers have not made up their minds to pay the advance required by holders. The following quotations fairly represent the market, the inside figures being the bid prices: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck-Bars.**—Prices show a good deal of irregularity, some asking as high as \$29, delivered, while others would accept orders at \$28. Sales have been made at from \$27 to \$27.50, but \$27.50 @ \$28 would be nearer the market to-day, although the offerings are limited, and with a fair demand prices could easily advance.

**Bar-Iron.**—The movement in Bars has not been in proportion to that in other departments, although there is a gradual stiffening, especially in desirable qualities. Offerings from some of the Ohio mills have

unsettled the market a good deal; Bars claimed to be of first-class quality having been offered at 1.70¢, delivered, for 50-ton lots and upward. Buyers did not respond, however, as there was a suspicion that the Iron was made from Old Rails. In many cases 1.75¢ @ 1.77½¢ is bid for local brands of established character, but at 1.8¢ @ 1.85¢, which is the usual asking price for such qualities, buyers hesitate or take only such small lots as they must have to go on with. The feeling would be very strong but for the persistent efforts of these Western men to unload their Iron on Eastern markets. Under present conditions buyers don't know what course to take, hence the market is feverish and unsettled, but generally a trifle dearer. Skelp Iron is doing better, and further interest is likely to be manifested before long. Prices are now about 1.75¢ for Grooved and 1.95¢ @ 2¢ for Sheared.

**Plate and Tank Material.**—This department of the Finished Iron trade at the moment leads all others in activity and strength. The mills are now full of work for the next couple of months, and while there is always room for the usual day-to-day demand, it is extremely difficult to place orders unless at an advance of at least ½¢ over last week's prices. Large orders are still more difficult to place, as the feeling is more deeply rooted than ever that prices will show further appreciation as the season advances. From the number of inquiries on the market there is little doubt that a great deal of business will have to be placed in the near future. Prices about as follows: 1.95¢ @ 2¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.1¢ for Universal Plates; Shell, 2.3¢ @ 2.4¢; Fire-Box, 3.5¢ @ 3.7¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.25¢; Shell, 2.5¢; Flange, 2½¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

**Structural Material.**—The demand during the week has been very heavy and mills have now about all the work they can handle during the next 60 or 90 days. The bridge builders are among the heaviest buyers, and as there is a vast amount of work to come on the market during the summer months, the feeling in regard to prices is very firm. For the present quotations are about as follows: Bridge Plate, 2.05¢ @ 2.10¢; Angles, 2¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—Business is reported to be in a very satisfactory condition, the entire output being taken without any opportunity for manufacturers to work on stock. Inquiries are numerous, and prospects indicate an unusually large consumption. Prices firm and unchanged, as follows:

Best Refined, Nos. 14 to 20.....	34¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined No. 28.....	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3½¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 ¢
Common, discount.....	.67½ ¢

**Steel Rails.**—The firmness noted last week has finally developed into a higher range of quotations. Sales in lots of 5000 tons and upward have been made at \$28 at mill, which is now considered an inside figure, although \$27.50 is quoted by those (it is said) not in a position to accept orders. There is no doubt that the market is in a sound, healthy condition, with a decided tendency toward firm if not higher prices.

**Old Rails.**—There is nothing doing in this market, so that prices are entirely nominal. A few lots have been taken in the interior at \$23, delivered at mills, but

the demand is slow and prices inclined to weaken. A 600-ton lot of old Steel Rails was taken at \$17, delivered at mill, and a lot of short pieces at \$1 less.

**Scrap-Iron.**—There is a very good demand, and desirable lots are promptly taken at full quoted rates, which are about as follows: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$16.50 @ \$17.50; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The demand is increasing, and, with some pressure for early deliveries of certain sizes, prices are very firm, although for the present discounts are unchanged, as follows: Butt-Welded Black, 52½ ¢; Lap-Welded Black, 65 ¢; Butt-Welded Galvanized, 45 ¢; Lap-Welded Galvanized, 52½ ¢; Boiler Tubes, 60 ¢.

**Nails.**—The market is gradually hardening, but as yet there is no quotable change in prices. Carload lots are available at from \$1.80 to 1.85, according to brand, and lots from store at \$1.90 @ \$2.

## Chicago.

Office of *The Iron Age*, 58 Dearborn street,  
CHICAGO, June 10, 1889.

The conditions of the Iron trade have undergone a very favorable change since the first of the month. Railroads have come into the market for Rails and Track Supplies in round quantities. It is reported that orders for 4500 cars were placed last week and that there are inquiries for 5000 more that have not yet been contracted for; all from lines in the South and West. The effect is already reflected on the Pig-Iron, Bar-Iron, Steel and kindred branches of merchandise. Crop prospects are very favorable to an unsurpassed yield, which means larger consumption of manufactured articles and increased freight traffic.

**Pig-Iron.**—A desire to buy Pig-Iron seems to have taken hold of all classes of consumers within the last ten days. A large consumer closed negotiations the early part of the week for about 5000 tons, which was a fair indication that he was satisfied the bottom had been reached. Other buyers in the same line of manufacture took the cue and went shopping for the best terms they could get. The increase in inquiries bolstered up the sellers—and they did not need much prodding—to such an extent that they are now predicting higher prices within the next two months. This may be brought about if the furnaces that are selling at prevailing figures are completely sold up and the field left to those who now decline to accept long-time orders. The tone of the market is stronger and under continued heavy buying the lowest prices may be abandoned. Charcoal Irons are in better demand than they have been any time in the last three months. Dealers in Ohio Irons are renewing their efforts to make sales since railroads reduced freights to \$1.80 per gross ton, taking effect on the 8th inst. Makers of foundry grades of Southern Iron are less inclined to press sales than they were several weeks ago. They claim to be sold up, but it is more likely that they cannot make the price low enough to sell the Iron without incurring a loss. Southern Mottled and Gray Forge Irons are offered quite freely, and sales of round lots have been made at very low figures. The reduction of 50¢ per ton on local Coke Irons is the result of competition on large orders recently placed. In this grade of Iron small buyers can do about as well as the big fellows. It would not require very heavy buying of Car-Wheel Irons to make them advance 25¢ a ton from the lowest



figures. Indications point to an early improvement in the demand for this grade. We quote as follows, cash, f.o.b. Chicago: Lake Superior Charcoal, \$18 @ \$18.50, all numbers; Local Coke, No. 1, \$15.50; No. 2, \$14.50; No. 3, \$13.50; Chicago and Bay View Scotch, \$15.50 @ \$16; American Scotch (Blackband), \$18; Southern Coke, No. 1 Foundry, \$15.50; No. 2 Foundry, \$14.75; No. 3 Foundry, \$14; No. 1 Soft, \$15; No. 2 Soft, \$14; Gray Forge and Mottled, \$13; Hanging Rock, No. 1, \$18.25; No. 2, \$16.25; Tennessee Charcoal, No. 1, \$18.75; No. 2, \$17.75; Alabama Car-Wheel, \$24 @ \$25.

**Bar-Iron.**—There was quite a good inquiry for Bars on car specifications and merchant trade. Freight rates to Chicago from Pittsburgh were reduced to 11¢ and from Youngstown to 9¢ @ 100 lb, and manufacturers made a corresponding reduction. In carload lots mill price on Common Iron, f.o.b. Chicago, is quoted at \$1.55 and Single Refined at \$1.70, half extras. Best Refined from store is quoted at \$1.80 @ \$1.85. The demand for the better grades is less active in consequence of the difference in price. The market for the cheaper grades is irregular and subject to quick changes. Some manufacturers anticipate a long shut-down in July and will not take orders for delivery beyond that date, while others do not and are grabbing up everything in the way of an order that they can get. On car specifications \$1.57½ flat is named.

**Structural Iron.**—During the week several large building projects developed. The demand for bridge material, immediate shipment, was quite active. Foundries are figuring very close on Cast-Iron work, and not always supplying the Beams at a profit. The demand for standard sizes from stock is increasing and also the delays in obtaining them. Quotations continue as follows, f.o.b. Chicago: Angles, 2.12¢ @ 2.15¢; Universal Plates, 2.15¢ @ 2.20¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. From stock small lots are quoted at 2.25¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees and 3.40¢ for Beams.

**Plates, Tubes, &c.**—Business is reported fairly good in small lots from store both in Iron and Steel Plates. Jobbers' stock sheets show that they are prepared to let the mills take a rest in July if they want to without their being put to much inconvenience. There was no change made in the discount on Tubes last week. There continues to be a steady demand from the regular trade and a noticeable increase from railroads. We quote as follows from store: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 57½¢ off for 1½-inch and less and 62½¢ off for 2-inch and larger.

**Sheet-Iron.**—Jobbers are having quite an active demand for Black Sheets and it is doubtful whether a large order could be placed with manufacturers for delivery before the last half of July. Makers continue to quote 2.85¢ @ 2.90¢ on No. 27, subject to shut-down. Store prices range from 3.20¢ to 3.30¢ on No. 27, according to quality.

**Galvanized Iron.**—Mill agents report a very active trade. In comparing last week with the previous week it would seem that buyers withheld their orders the last week in the month and rushed them in as soon after the 1st as possible. Business is still confined to bundle lots, on which jobbers quote 65¢ off on Juniata and 65¢ and 5¢ off on Charcoal.

**Merchant-Steel.**—A good week's business was done on low-grade Steels. Orders from manufacturers were larger and more numerous. Quite a number of inquiries for Toe Calk, Machinery and Soft-Center Steels were received for immediate delivery from parties who have not been buying in this market. Tool Steels were also in better demand. Dealers are inclined to hold prices pretty firm on store shipments. Manufacturers are quoting 1.80¢ rates on Soft Bessemer Steels, but this price has been shaded on round lots and extended deliveries. We make the following quotations from store: Mixed Machinery Steel, 2.10¢ @ 2.20¢; Tool Steel, 7.75¢ @ 8.50¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.50¢ @ 3¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Steel Rails.**—Since the first of the month there is a great change in the status of the Rail market. The Illinois Steel Company have booked orders enough to keep two and perhaps three of their mills in operation until late in the fall. The Joliet Mill was started up last week and the Union Mill will start to-day—Monday. It is said railroads have been withholding contracts for the purpose of getting them into the construction account for the last half of the year. Some companies are in great need of the Rails, and should have ordered them two months ago. Manufacturers continue to quote \$29 @ \$30 on small lots. New orders for immediate shipment would command the outside price.

**Track Supplies.**—Inquiries for Track Supplies have kept pace with the improved condition of the Steel-Rail market. A good many orders have been placed, but large buyers have not yet contracted for anything beyond immediate wants. Prices are a little irregular and if anything weaker on nearly all of the articles coming under this heading. Fish-Plates are quoted 1.70¢ @ 1.90¢, according to quantity and time of delivery; Bolts with Square Nuts, 2.50¢; Bolts with Hexagon Nuts, 2.60¢ @ 2.70¢; Spikes, 1.85¢ @ 1.90¢.

**Old Rails and Wheels.**—Since consumers have been looking around for lots of Old Rails holders are less inclined to sell at present prices. Stocks are scarce, and all transactions have been confined to small lots, which are quoted at \$19.75 @ \$20. Old Steel Rails, long lengths, are quoted at \$17 @ \$18 and short lengths at \$14 @ \$15. Old Car-Wheels were in very good demand. Car-Wheel makers have been getting a good many orders since the 1st of the month, and they are now trying to buy Old Wheels. They find that the holders are unwilling to sell just at the time they want them. Wheels that could have been bought at \$16 two weeks ago cannot be had at \$17 now. Buyers have offered \$16.50 freely during the week, but we hear of no transactions at that price. A number of inquiries are on the market for lots of 500 and 1000 tons, for which consumers would pay about \$17. If the demand proves to be as urgent as it appears to be Wheels are likely to sell at \$18 before the week closes.

**Scrap.**—While there have been a good many inquiries for low-grade Scrap and some improvement in the demand for better grades, transactions have not been very heavy. On a ton of 2000 lb dealers make the following quotations: No. 1 Wrought, \$17.50; Fish-Plates, \$18; Axles, \$21; Horseshoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plate, \$9; Cast Borings, \$8; Wrought Turnings, \$10; Coil Steel, \$13; Leaf Steel, \$14.50; Locomotive Tires, \$14.50; Track Scrap, \$16; Mixed Country Wrought, \$12.

**General Hardware.**—The demand for all classes of Hardware continues to be very good. There is an inclination on the part of manufacturers to stiffen prices. At a meeting of the manufacturers on the 6th inst. Mattocks, Grub Hoes, Clay, Ore, Tamping and Coal Picks were advanced about 10% and are now quoted by jobbers at 60% and 5% off. The advances made recently on other lines are being well maintained. Traveling men report to their respective jobbing houses that the feeling throughout the country is very encouraging. Dealers are inclined to anticipate their wants and jobbers are having all that they can do.

**Nails.**—Manufacturers succeeded in unloading probably 15,000 to 20,000 kegs of Nails in this market last week. It is well understood that in order to do this prices had reached a figure that was considered bottom. Jobbers for the time controlled the market and manufacturers accepted or rejected the prices named as seemed best in their judgment. While the demand for Nails in small lots is very active there are very few buyers who are willing to take carloads of exclusively Cut Nails. On orders for mixed cars of Cut and Wire Nails jobbers quote \$1.85 for Cut Nails and \$2.30 for Wire. In small lots Cut Nails are quoted at \$1.90, and Wire Nails at \$2.85. At a meeting of the local jobbers last week the new card on Wire Nails was adopted, but they make no change in their quotations. The card for small sizes was not adopted and jobbers continue to quote on the old list and discount. A meeting of the manufacturers of Cut Nails is called for the 12th inst. for the purpose of changing the card to 60d base and advancing the price to \$2.

**Barb-Wire.**—Manufacturers are running their mills to their full capacity and have no stocks on hand. The demand for small lots continues very good, and prices firm at 2.75¢ for Painted Wire and 3.35¢ for Galvanized. A circular has been sent out from St. Louis to the leading manufacturers of Barb-Wire in the country proposing a meeting at an early date for the purpose of conferring on the subject of forming an organization to control the Barb-Wire business. The scheme is to form a parent company, capitalized to an extent sufficient to purchase the plants of the principal manufacturers and have them all operated under a governing committee similar to the plan adopted by the Steel-Rail makers of this city. We understand the manufacturers of this section favor the holding of the meeting, but are not sufficiently acquainted with the details of the plan suggested to express their views on its feasibility.

**Pig-Lead.**—Prices during last week considerably stronger and sales active. About 500 tons changed hands at 3.80¢ @ 3.85¢, and the continued demand advanced the market to 3.90¢ asked. Buyers are offering 3.85¢, but sellers are not inclined to accept this figure at the close of the week.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,  
CHATTANOOGA, June 10, 1889.

**Pig-Iron.**—The past week has developed nothing that is particularly new, and the conditions of the market remain practically about as they were. While opinions differ as to how soon an advance will come, there are few who think an improvement will take place very soon. A more feverish disposition has manifested itself quite lately, and the market is being watched with much more interest than for some time past. It must be admitted that the existing conditions cannot long continue, and that a change of some kind cannot be far off. The de-

mand for our best grades of Foundry Irons from New York continues quite as active as ever, and recent sales were made at \$16.50 @ \$16.75, delivered, cash 30 days, less commission. The products of all of our Southern stacks are not bringing these prices, and some sales have been made at prices considerably shaded, but there has been and still is a full demand from the Eastern markets for certain brands of our Irons, and they are being taken at prices that range at the top of the market.

## Louisville.

LOUISVILLE, KY., June 10, 1889.

**Pig-Iron.**—There have been some large orders placed here during the last week, one for 3000 tons. Heavy buying has also taken place in the surrounding territory. Prices, however, have not advanced, and 2000 tons of Gray Forge were offered here yesterday at \$12, cash, showing no improvement. The heavy purchases should lead to a slight advance, but so far this has not been the case. There seems to be a large number of buyers feeling the market, and some large purchases have been made by those who did not wish to run the risk of an advance later on, so have purchased their supply for the season 30 days earlier than they have been in the habit of doing. Opinions vary in regard to any immediate improvement. One of the largest buyers here feels that in November Iron will be as low as it is to-day, and that to purchase for any great length of time would simply be to lose the interest on the investment. We quote as follows:

Southern Coke, No. 1 Foundry..	\$14.25 @ \$14.75
Southern Coke, No. 2 Foundry.	13.75 @ 14.25
Southern Coke, No. 3 Foundry.	13.00 @ 13.50
Gray Forge .....	12.50 @ 13.00
White and Mottled, different grades	12.00 @ 12.50
Silver Gray, different grades .....	12.50 @ 13.50
Southern Charcoal, No. 1 Foundry	16.00 @ 16.50
No. 1 Mill .....	14.50 @ 15.00
Southern Car-Wheel, standard brands .....	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry .....	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry .....	19.50 @ 21.00
Hanging Rock, Cold Blast .....	20.75 @ 22.75

## St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., {  
St. Louis, June 10, 1889. }

**Pig-Iron.**—The market shows more activity than for two months past. Inquiries are plentiful and some good sales have been made, but prices were necessarily low. One lot of 1000 tons Southern Foundry Iron was taken at about \$14.75, delivered. There are negotiations now in progress for 2000 or 3000 tons of Gray Forge, which it is expected will be closed in a few days. While there is no material advance in prices, yet the situation is decidedly improved, and the general opinion of consumers is that bed-rock has been reached, and if they intend taking advantage of the low prices now ruling, now is the time. The furnaces have apparently come to the same conclusion, and are consequently quoting prices with more firmness and are not disposed to book orders for delivery later than July 1. Of course the improvement may only be temporary, but as buyers and sellers alike seem confident, it is quite probable a better market will be the result. For ordinary-sized lots we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$15.25 @ \$15.75	
Southern Coke, No. 2 Foundry, 14.75 @ 15.25	
Southern Coke, No. 3 Foundry, 14.25 @ 14.50	
Gray Forge .....	13.25 @ 13.75
Ohio Softeners .....	17.00 @ 19.00
Lake Superior Charcoal .....	19.75 @ 21.50
<i>Missouri.</i>	
Charcoal Foundry, No. 1 .....	16.00 @ 16.50
Charcoal Foundry, No. 2 .....	15.00 @ 15.50
<i>Tennessee.</i>	
Charcoal Foundry, No. 1 .....	17.00 @ 18.00
Charcoal Foundry, No. 2 .....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.55; St. Louis, \$4.70.

**Bar-Iron.**—In sympathy with Pig-Iron this department shows increasing strength. Some fair-sized orders were placed during the past week, and inquiries received indicate an increasing activity. The mills are well employed and are likely to be so for some time. Small lots from store are quoted at \$1.80; carload lots, from \$1.60 to \$1.70, according to circumstances.

**Barb-Wire.**—Trade is moderately active and mills are working with full forces. Stocks of Wire are unusually light for this season of the year, the large spring trade having taxed the mills to their full capacity. Prices are quoted firm, with an advancing tendency. The plant of the American Wire Company was disposed of at auction on the 5th inst., H. L. Fox & Co., of this city, being the purchasers. Mills quote from \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized; carload lots at from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

## Cleveland.

CLEVELAND, June 10, 1889.

**Iron Ore.**—Sales of Ore during the past week have been confined to moderate amounts, although sufficient altogether to make a fair showing and to bring the aggregate transactions since the opening of the season close up to 4,000,000 tons. With this amount of Ore contracted for, furnacemen are not particularly solicitous regarding additional purchases, and are not attempting to force their demands. It seems to be the prevailing opinion that not less than 750,000 and probably 1,250,000 more tons of Ore will be sold this season than last, and there are several months still open in which to do the buying. The furnacemen having already bought liberally seem inclined to await developments in the Iron market before filling out their stocks. Considerable Ore is being sold from day to day, but the score or more of really large purchases calculated to practically terminate the season's business may not be made until the latter part of July. All attempts to increase transportation rates on the lake have thus far failed. Ore is coming down to Lake Erie ports at a tremendous rate and is being hurried forward to the furnaces almost as rapidly. About 1,250,000 tons have thus far been shipped from the Lake Superior district, against about 450,000 tons at a corresponding period last year. Fair grades of Gogebic Bessemer Ores have sold during the past week at \$5, Cleveland delivery, and considerable Non-Bessemer ore from \$3.60 to \$4. Minnesota Ore continues to command \$5.75 and Republic Ore is bringing the same figures, with Menominee Bessemer in fair demand at \$4.90 @ \$5.15.

**Pig-Iron.**—The market is evidently improving in activity, although prices are still weak and far from stationary. It is undisputable that a considerable quantity of Iron is being sold from week to week, but the amounts are generally small, and the prices paid mean little if any profit to the furnace men. Despite all the discouraging features the situation generally is improving. Buyers are placing orders more frequently and seem to fully realize that any further reduction in prices is out of the question. There are not wanting evidences of an increasing confidence in the market. With this improvement has come a slightly better demand, in which future needs are in a measure considered. The following are the present cash quotations:

Nos. 1 to 6 Lake Superior Charcoal .....	\$20.00 @ \$20.50
No. 1 Strong Foundry, Bessemer quality, # ton .....	16.00 @ 16.50

No. 1 Strong Foundry, # ton ..	15.50 @ 16.00
No. 2 Strong Foundry, # ton ..	15.00 @ 15.50
No. 1 American Scotch, # ton ..	16.00 @ 17.00
No. 2 American Scotch, # ton ..	15.00 @ 16.00
No. 1 Soft Silvery, # ton .....	16.50 @ 17.50
Mahoning and Shenango Valley Neutral Mill Irons, # ton .....	14.00 @ 14.50
Mahoning and Shenango Valley Red Short Mills, # ton .....	14.50 @ 15.00

**Scrap-Iron.**—The market lacks vitality. Old Axles are in some demand, but Old American Rails even at \$21 are selling sparingly. There are still plenty of Old Wheels to be had, but there are few purchasers.

**Manufactured Iron.**—Common Bar at 1.60¢ is in only fair demand. Sheets are scarce and buyers are purchasing sparingly.

**Nails.**—The market is still weak, though prices are no lower. Steel Wire Nails at \$2.30 are most in demand. Cut Nails are firm at \$1.75 at mill.

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. {  
CINCINNATI, June 10, 1889. }

**Pig-Iron.**—Further weakness, if such a thing is possible, destroyed the hopes of producers of Pig-Iron for immediate recovery of prices during the week under review, but the continued active demand from agricultural works, which have been stimulated by the improved general crop outlook, and the larger purchases of Pipe works, which have been tempted by the extraordinarily low prices to supplement previous purchases on a higher level, have encouraged the attachment formed for the spirit of confidence which is so necessary to assist real facts to redeem the market. In addition to the larger transactions on the account referred to, there have been increased sales of a scattering nature, foundries and various shops being desirous of increasing stocks. A number of furnaces are making Iron at a loss, but while impatient and restive under the business ban, refuse to blow out while expecting a turn in the market. The volume of business transacted here during the week has been largely made up of small lots, between car lots and 500 tons, but there have been several 1000-ton lots on the basis of current quotations. There has been some trouble in harmonizing views of deliveries, or even larger sales might be added to the list. The aggregate sales, however, have been quite large, being in the neighborhood of 24,000 tons, all told. The following are the approximate prices current here at the close for cash, f.o.b.:

### Foundry.

Southern Coke, No. 1 .....	\$14.00 @ \$14.50
Southern Coke, No. 2 .....	13.50 @ 14.00
Southern Coke, No. 3 .....	13.00 @ 13.50
Ohio Soft Stone Coal, No. 1 .....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2 .....	14.50 @ 15.25
Mahoning and Shenango Valley .....	16.00 @ 16.50
Hanging Rock Charcoal, No. 1 .....	20.00 @ 22.00
Hanging Rock Charcoal, No. 2 .....	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1 .....	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2 .....	16.50 @ 17.00

### Forge.

Strong Neutral Coke .....	12.75 @ 13.00
Mottled Neutral Coke .....	11.75 @ 12.00
Gray Forge .....	12.50 @ 12.75

### Car-Wheel and Malleable Irons.

Southern Car-Wheel .....	20.00 @ 24.00
Hanging Rock, Cold Blast .....	22.00 @ 26.00
Lake Superior Car-Wheel and Malleable .....	20.00 @ 21.00

**Manufactured Iron.**—There has been a moderate trade only and an easy tone has prevailed, without essential change in prices.

**Nails.**—The demand has been a little improved, but prices have not changed essentially. Steel Nails, 12d and 40d, sell at \$1.80 @ \$1.90 # keg, with 10¢ rebate in carload lots at the mills, and Steel Wire Nails at \$2.40 @ \$2.50 # keg.

**Old Material.**—There has been a moderate demand for Rails and a steady market, with sales at \$20, spot. Old Wheels have met a moderate demand at \$16, but holders generally demand more, without success.

## Detroit.

WILLIAM F. JARVIS & Co., under date of June 10, 1889, report as follows: The condition of the market remains about the same as it has been for the past two or three weeks. Furnace men in this section feel confident that an advance will take place in the near future, and are holding very firm at present prices, and some refuse to contract for delivery extending beyond August. Inquiries for larger amounts of Lake Superior Charcoal Iron have been received in the last few days than for some time past, and this, with the present restricted production, we think, will very soon have its effect upon the market. Business has been quiet during the past week, and we quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.50 @ \$20.00
Lake Superior Coke, all ore.....	18.00 @ 19.00
Lake Superior Coke, cinder mixed.....	17.75 @ 18.25
Standard Ohio Black Band.....	18.00 @ 19.00
Southern No. 1.....	18.50 @ 17.00
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	16.00 @ 16.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.75
Old Wheels.....	18.50 @ 19.00

## New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, June 12, 1889.

A distinctly better feeling is perceptible among sellers, and for some Iron and Steel products a somewhat higher range of prices prevails. Even where no advance has been made the prices now obtained are closer to the quotations heretofore given. The day for concessions seems to have passed, all indications pointing to a more satisfactory condition of trade in the future.

**Pig-Iron.**—A great deal of Iron is being sold in this market at present, but the transactions are mainly confined to Southern brands. Northern furnace companies appear to be well sold up, and are making heavy shipments, some of them having delivered more Iron to consumers during the past week than in any previous week for a very long time. Although the inquiry is increasing and a better feeling prevails all along the line, there is no advance in prices save in the case of the Thomas Iron Company, whose quotations have been marked up to \$17 for No. 1 and \$16 for No. 2. Enough other furnace companies are still to be found willing to accept old price to prevent a general advance. Representatives of Ohio furnaces making Soft Irons report increasing sales among consumers in this vicinity at \$18.50 @ \$19, which is much under the rates at which Scotch Pig can be imported. Northern Irons of good quality are quoted at tide-water all the way from \$16.50 to \$18 for No. 1, according to brand; \$15.50 @ \$17 for No. 2; \$14.50 @ \$15.25 for Gray Forge. Southern brands sell at \$16 @ \$17 for No. 1; \$15.50 @ \$16 for No. 2; \$14.75 @ \$15 for No. 3; \$14.25 @ \$14.50 for Gray Forge, all delivered at New York.

**Scotch Pig.**—Business in Foreign Iron is now of very small proportions; nevertheless shipments continue to be made this way. Quotations are as follows: Dalmington, \$19.50 @ \$20; Summerlee, \$21.50; Langloan, \$21; Coltness, \$21.50 @ \$21.75.

**Spiegeleisen.**—Transactions are limited at \$28.50 for 20% English and \$60 for 80% Ferro.

**Wire Rods.**—Importers are unable to quote better than \$43.50, which is prohibitory.

**Bar-Iron.**—A light business is reported in this line, but inquiries are being received from heavy buyers who are evidently of the impression that bottom has been touched. Some mills are asking  $\frac{1}{8}$ ¢ advance on the following quotations: Common, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.75¢ @ 1.9¢, for carload lots on dock.

**Structural Iron and Steel.**—Heavy orders for this class of material have been entered during the past week and prices are decidedly firmer. The market is more active than at any previous time this year. New bridges, new roofs, &c., are needed to take the place of those destroyed by the recent floods, and the mills are already feeling this impetus to trade, which promises to continue for some time. Quotations for delivery on dock are as follows: Sheared Plates, 1.95¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2¢ @ 2.1¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢.

**Plates.**—Some good-sized transactions are reported and the market is strong, with an upward tendency. Quotations are as follows for delivery on dock: Tank Iron, 2¢ @ 2.1¢; Shell, 2½¢ @ 2.5¢; Steel Tank, 2.25¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.7¢ @ 2.8¢; Fire-box, 3.25¢ @ 4¢.

**Merchant-Steel.**—Small lots are moving freely, but large sales are rare. Tool Steel, good brands, in large lots, is still quoted at 7¢ @ 7½¢; specials, 12½¢ @ 20¢; Crucible Spring, 3½¢ @ 4¢; good Open-Hearth Machinery, 2.80¢ @ 2.5¢; common ditto, 2¢ @ 2.25¢; Open-Hearth Spring, 2½¢ @ 2.5¢; Sheet, 6½¢, 8½¢ and 10½¢. Some orders are now being received in this market which belong naturally to the West.

**Steel Billets.**—A limited demand has been experienced for some time, but new inquiries are now coming forward which may lead to business. Four-inch Billets are quoted at \$30, at mill, with some makers probably ready to shade these figures.

**Wrought-Iron Pipe.**—A contract for 25 miles of 6-inch Pipe for an oil line was made this week at the advanced rates, and further lots of considerable magnitude are under negotiation.

**Steel Rails.**—An order for 27,000 tons, which may be increased to 37,000 tons, is understood to have been taken by mills in the West. The Eastern manufacturers have entered orders during the week for small lots only, ranging from 200 tons to 1000 tons, but which aggregated quite a considerable amount. Inquiries are in the market for 15,000 tons or so, representing desirable cash purchases, while there are numerous others in which bonds and stock or long notes are important elements. An increased allotment of 200,000 tons has been granted to some of the mills whose sales have covered the amounts formerly awarded them. Inquiries from foreign buyers have made their appearance to some extent. Our manufacturers have been asked to bid on Canadian and Mexican orders. There is some chance of their securing the latter, as the Rails are needed promptly and the buyers assert that they cannot wait for shipments by Transatlantic makers. Prices are firm at \$27.50 at mill, with every indication of a further advance in the near future.

**Track Supplies.**—Large sales of Fish-Plates were made during the week, but at very low prices. In some instances Steel Fish-Plates were sold lower than Iron. There are more inquiries now than for the whole of the previous month, and probably some of the low sellers may soon fill up. Quotations for Fish-Plates of Iron or Steel range from 1.75¢ to 1.85¢; Track Bolts, Square Nuts, 2.70¢ @ 2.75¢; Hexagon Nuts, 2.80¢, Common Iron, and 3¢, Refined; Spikes, 1.95¢ @ 2¢.

**Old Material.**—Consumers of Old Iron Rails are actively searching for cheap lots, but are finding none, and are paying the prices asked. Sales have been made at \$22. No. 1 Scrap is in better demand, but buyers are only offering \$20, which does not quite come up to the ideas of sellers. Cast Scrap is particularly dull, and is quoted at about \$14.50, with \$15 as the top notch. Other values are not changed, with \$13.50 @ \$14 for Turnings, delivered, and \$9.50 @ \$10 for Cast Borings.

Frank D. Moffat & Co., agents for Columbia Iron and Steel Company, Central Forge Works, Brier Hill Iron and Coal Company and Rochester and Pittsburgh Coal and Iron Company, have removed their offices from 100 Beekman street, New York, to the Market and Fulton Bank Building, 81 Fulton street.

L. Hershheim, who had charge of the Iron department of John A. Jansen, of this city, and who is well known in the Iron trade, has resumed business on his own account at 40 and 42 Wall street. Mr. Hershheim has close connections with all the more prominent producers abroad, and will continue to import Spiegel, Wire Rods, Billets, &c.

## Financial.

The instantaneous destruction of at least \$50,000,000 of property, principally by floods in Pennsylvania, but including, say, \$6,000,000 by the burning of the city of Seattle, on the Pacific Coast, has a more or less disturbing effect in several departments of business, from which recovery cannot be immediate. The consequences more directly apparent are the interruptions of transportation, but already the Pennsylvania Railroad has resumed through traffic with the West, and thousands of skilled men are building bridges over all the flooded region. The iron-works and other manufacturing establishments that were partially wrecked are being restored without delay. The lumber market will doubtless be affected by the destruction of the timber booms at Williamsport, the equivalent of probably 250,000,000 feet being withdrawn from the usual supply. The coal companies are enabled to maintain their full schedule of prices, in consequence of the flooding of collieries and the enforced shortened production. The wheat harvest has commenced actively in several States, with excellent prospects. In San Francisco the first new wheat came to hand 24th ult., and the promised yield is fully 72,000,000 bushels, the largest ever known in California. The Kansas board reports an unusually good condition of the crops. The product of winter wheat is estimated at 33,780,000 bushels, an excess over previous years.

The stock markets were moderately active, with a firm undertone. The news generally has been unfavorable, indicating a fresh outbreak of rate disturbances in the West. Crops have suffered from storms, the bank statement was depressing, showing the effect of gold shipments. The coalers on Monday were strong, on the improved prospects of the trade. The principal demand was for New Jersey Central, and Delaware and Hudson rose nearly to the price of Lackawanna. New York Central and Lake Shore were also conspicuously strong. The stock of the Cambria Iron Company, whose par is 50, sold up to 92 in Philadelphia, or only 8¢ below its price just before the flood.

Tuesday was a great day for coal stocks. In the afternoon the feature was a further sharp advance in Central New Jersey and in Delaware and Hudson, which crossed Lackawanna for the first time in many

years. This advance is on the idea that the anthracite coal trade is under the control of the producers, and that the public will be compelled to take coal at the prices named by the companies. Another theory was that some parties had an inkling of the coming Interstate decision in the suit of Cox Brothers & Co. against the Lehigh Valley, and that they were working the market. The street talk is that the Sugar Trust made \$3,500,000 last month.

An examination shows that the Chesapeake and Ohio Canal can be repaired for \$300,000.

United States bonds are quoted as follows:

U. S. 4½, 1891, registered.....	106½
U. S. 4½, 1891, coupon.....	106½
U. S. 4, 1907, registered.....	128
U. S. 4, 1907, coupon.....	129
U. S. currency 6s.....	118

The bank statement of Saturday showed a loss of over \$3,500,000 in surplus reserve, which now stands at \$11,026,785. In loans there was an expansion of \$2,071,200. Thus far the money market has not been affected by the loss of gold beyond a slight hardening tendency. Time money has been firm at 3½ % @ 4½ % for terms ranging from 60 days to nine months. Commercial paper continued in good demand, with light offerings. There is very little paper-making, and a 4 per cent. rate does not bring out much paper even from those who will need funds a little later.

The imports at New York for the last month were \$42,908,000, the largest May receipts for seven years, and with two exceptions the largest in the history of the past. The total in merchandise, exclusive of specie, is \$4,500,000 in excess of the corresponding month of last year. For 11 months ending May 1 the imports were \$429,738,900, exclusive of specie, as compared with \$422,609,900 for the corresponding period last year. Turning now to the exports, the total for May was \$42,296,000, which is a gain of over \$2,000,000 in produce and merchandise and of \$7,000,000 in specie upon the corresponding month of last year. For 11 months the total is \$355,839,000, including nearly \$60,000,000 in specie. The continued large export of gold, despite a balance of nearly \$60,000,000 in favor of this country, is believed to be due to the withdrawal of foreign capital under apprehension of the ultimate adoption in the United States of the silver standard. It may be said, therefore, that gold shipments are the special feature in our foreign commerce and of much significance.

The general markets were dull. Breadstuffs favored buyers, with no important changes, and for grain there were no important orders from any source. Provisions were duller than for months.

The total clearings of 38 cities last week showed an increase of 28.1 %. Outside of New York the increase was 9.8 %. New York gained 40.5; Boston, 14.8; Philadelphia, 17.1; St. Louis, 24.9; Cincinnati, 11.4; New Orleans, 21.4; Kansas City, 7.7; Louisville, 33.9; St. Paul, 20.5; Memphis, 16.2; Cleveland, 15.9; Columbus, 33.2. Chicago decreased 5.1.

The American Bankers' Convention hold their annual meeting in Kansas City, September 25 and 26.

The Birmingham clearing-house, the first organization of the kind in Alabama, begun business a week ago with nine members and an aggregate capital of \$2,300,000. The clearings for the first week aggregate \$554,744.

A. G. Wilson was re-elected president of the Consolidated Exchange.

The imports of merchandise for the week at this port were valued at \$8,731,000, and the exports, \$6,382,344. The latter included 250,000 bushels of wheat, 781,000 bushels of corn and 15,381 bales of cotton.

## Metal Market.

**Copper.**—After some slight fluctuations London closed last night at the same figure with spot Copper that ruled on Wednesday of last week, £41. 12/6, and with futures at £41. 5/, sales being light, some 700 tons. Nor has there been any change here, nothing being obtainable under 12¢, Lake Ingot, which is jobbing at 12½¢ @ 12¾¢ in a moderate way, and for casting brands the asking rate is 11¢ @ 11½¢. Messrs. James Lewis & Son, Liverpool, in their monthly report of June 1, express themselves as follows: "The official liquidator of the Comptoir d'Escompte visited London on the 28th ult., but so far his interviews with the representatives of the mining companies located there do not appear to have led to any satisfactory result, as it is understood that some of the companies decline to be parties to any fresh combination to advance prices and reduce production." The following telegram takes a favorable view of the situation on this side: "Boston, June 8.—The total figures of the Lake Superior production of Copper in May show an increase of 523 tons of mineral from the 12 active mines over 1888, an increase of over 750,000 lb, while the total product for the first five months of this year aggregates fully 35,500,000 lb, or 4,000,000 lb more than the same time last year. This, in the face of the fact that a year ago the Copper Syndicate operations were in force and now the price is 4½¢ @ lb less, and stocks have accumulated so largely, is significant. The reason is that foreign bankers have agreed to keep their holdings of Lake Copper off of the American market, and as domestic consumers are bare of stocks by reason of the very small purchases while the price was unsettled, they are now buying freely at 12¢, and it is believed that an increased production is warranted by the increased demand on this account, as well as by the increased uses for the metal." The import of American Copper into Liverpool and Swansea during the first five months has been 11,561 tons Fine, against 12,316 same time last year and 2963 in 1887. The domestic export of Ingot Copper from this country during the first ten months of the fiscal year was 13,469,686 lb, as compared with 21,805,946 the previous year. The closing price on the Metal Exchange was 11.95¢ bid.

**Tin.**—The London market has been irregular, without any well-defined tendency. At the time of our last report London stood £91 with spot and £91. 15/ futures, the respective quotations last night being £91. 10/ and £92. 5/; sales 500 tons. Here Tin has gone on offering rather freely, without much readiness being shown to take hold of the metal either for speculative or consumptive purposes, 10 tons August and 10 tons September bringing 20.50¢ and spot 20.40¢. The import of Tin into this country the first ten months of the fiscal year has been 28,254,366 lb, as compared with 25,218,068 the previous year. Tin, on the spot, closes to-day 20.37½¢ @ 20.40¢. Closing quotations on the Exchange are 20.25¢ bid and 20.35¢ asked.

**Tin-Plates.**—There is no material change in the situation; the price of Coke Tins is a shade weaker, as the dealers prefer to sell current arrivals rather than store. Future orders are still held in abeyance on account of the makers not yet being ready to concede the 3d per box which stands between buyers and sellers. We quote large lines, ordinary brands, 3 box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.22½ @ \$4.32½, and Wasters \$4.12½ @ \$4.15. There were imported into the United States during the first ten

months of the fiscal year, 505,920,443 lb of Tin-Plates, against 514,374,629 in 1888.

**Lead.**—Sales of Common Domestic for the week sum up some 1200 to 1500 tons at 3.97½¢ @ 4¢, the bulk being taken by consumers, but only about 200 tons of the above this week, there being a lull in the demand for the moment, but no recoil. The quotation to-day in the open market is 4¢, and at St. Louis it is 3.75¢ @ 3.80¢. At the Metal Exchange between calls 32,500 tons of August Lead were sold to-day at 3.95¢. Mr. Maas, the manager of the Stolberg Company, in Germany, has for over a year past been striving to bring about a European Lead syndicate for the creation of a common sales office and a curtailment of output, but in vain, the Spanish mines raising too many difficulties. It is now asserted that the latter are purposely modifying their future contracts with smelters, and that this accomplished they have notified Mr. Maas they would then be ready to join the compact. On the Exchange closing quotations are 3.90¢ bid and 4¢ asked.

**Spelter.**—Domestic Spelter is selling in St. Louis at 4.85¢, equal to 5.15¢ in New York. The last sales made during the week in this city have been at 5¢. Silesian remains 5½¢.

**Antimony.**—The improvement in London is due to the scarcity of Ores over there. At the advance recently established our market has been quite active at 14¢ Hallet's and 15½¢ Cookson's.

### New York Metal Exchange.

The following sales are reported:

FRIDAY, June 7.

16 tons Lead, spot.....	4.00¢
96 tons Lead, June.....	4.00¢
162 tons Lead, July.....	4.00¢

TUESDAY, June 11.

10 tons Tin, August.....	20.50¢
10 tons Tin, September.....	20.50¢

WEDNESDAY, June 12.

16 tons Lead, August.....	3.95¢
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## Imports.

### Hardware, Machinery, &c.

Boker, Hermann & Co., Mdee., ca., 49  
Braid Co., Mach'y, cae., 1  
Clark Thread Co., Mach'y, pgs., 70  
Clark, G. A. & Bros., Mach'y, ca., 88  
Field, Alfred & Co., Arms, ca., 10; Cutlery, ca., 27  
Folsom, H. & D., Arms Co., Arms, ca., 7  
Graef Cutlery Co., Hdw., ca., 4; Chains, cks., 8; Cutlery, ca., 6  
Hartley, Graham & Co., Arms, ca., 42  
Meachim Arms Co., Arms, ca., 18  
Pim, Forwood & Co., Mach'y, pgs., 11  
Rotterdam S. S. Co.'s Agent, Arms, ca., 43  
Schwarzenbach, Huber & Co., Mach'y, ca., 5  
Tryon, E. K., Arms, ca., 19  
Weslemann, H., Arms, ca., 22  
Wiebusch & Hilger, Lim., Mdee., pgs., 36; Arms, ca., 14  
Wymann & Co., Arms, ca., 23  
Wagner, W. F., Anvils, 6  
Order: Mach'y, bales, 5; ditto, ca., 23; Hdw., pgs., 15

## Coal Market.

The Anthracite Coal market is affected but slightly by the recent deluge in the mining regions, beyond a temporary curtailment of supplies and consequent stiffening of prices. The small sizes of Steam Coal, such as Pea and Buckwheat, have been in better demand, the ordinary receipts of Bituminous having been reduced by interrupted transportation. The reported production for the week is 580,000 tons, which is considerably below the average for some weeks past, and at least 100,000 tons below the corresponding week last year. Reading's contribution dropped to 85,000 tons, against 125,000 tons for the previous week, showing the effects of the flood. Since January 1 the total is 12,733,601 tons, a decrease of nearly 1,500,000 tons compared with the same time in 1888. Quotations f.o.b. are for Free-Burning Broken, \$3.85; Egg and Chestnut, \$4; Stove, \$4.30; Hard White



Ash at Port Liberty, \$4.25. Bituminous Coal is still quoted at pool prices, \$3.25 f.o.b., though sales have been made during the week at an advance, to meet emergencies. The Beach Creek Railroad, it is said, will be crippled for some weeks to come. The main lines of the Bell's Gap Railroad, the Clearfield and Jefferson Railroad and the Tyrone and Clearfield Railroad are reported to be in good condition and are now in operation. The Cumberland reports 49,000 tons for the week, to June 1. In Philadelphia local companies having steamship contracts to fill in Clearfield Coal made extensive purchases of Virginia Coal to prevent delays in sailing.

In consequence of the liberal supply of vessels, the Reading Company have been able to make large shipments to the East and have reduced their stock at Port Richmond fully 50,000 tons, leaving only a fair working supply on hand. They now have 25 collieries working, an increase of 12 since Monday. It is said by some of those close to the Coal and Iron Company that a few of the flooded collieries will not be pumped out.

Harrison Coal Company get the Newark Water Works contract at \$2.38 gross ton for Pea, delivered at the pumping station, and the Lehigh Valley Coal Company were awarded by the Brooklyn Bridge trustees the contract for furnishing Broken and Red Ash Coal at \$4.10 and \$4.20 per ton. About 7000 tons of Coal are used yearly.

In the Pittsburgh region a number of the smaller Coke producers have shut down their works until the dull season is over.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 12, 1889.

Prices for Copper have fluctuated considerably, but business has been moderate and the market has been devoid of new features. There have been further interviews between the mine officials, but nothing tangible has resulted. The Tharsis Company, it is said, refuse to join any proposed combination. The public sale at Bordeaux of 800 tons mixed brands, for account of French banks, which has been advertised, was adjourned at the last moment at request of French consumers, and the secretary supplied the holders with cash warrants.

Block Tin recovered the early decline, in part, under the support of cash purchases. Advices from the Straits regarding the production have been conflicting. It is asserted that the dealers determined to ship sparingly this month in order that the market might improve, but it is believed that shipments will be correspondingly larger later on.

Scotch warrants sold at as high as 43/ under the influence of attempts to squeeze the "bears." This and realizations by outsiders resulted in a good business at about 42/9. There has, however, been an absence of fresh outside speculative buying and the market is now easier. The exports of Pig-Iron to the United States during May were only 8000 tons. There has been very little change in makers' brands of Scotch or in Middlesborough Pig or Hematites, and business, except in the latter, has shown no spirit.

Decided improvement in the demand for Tin-Plate is reported, and large orders are said to have been placed for some descrip-

tions at makers' prices. The belief is that there will be a further improvement. The Vernon Works are starting up four more mills and operations are being resumed at the Lewyarth works. The total stock at shipping ports is estimated at 319,000 boxes, against 282,000 boxes the corresponding time last year. The exports to the United States last month were 32,000 tons, against 26,000 tons during May, 1888.

Heavy orders for Steel have been booked at several establishments and the general market remains strong, without, however, any advance on the prices ruling last week.

The market here is said to be practically bare of Old Iron Rails and Scrap Iron. Prices are therefore nominal.

**Scotch Pig.**—There has been only a moderate business, and prices show little change.

No. 1 Coltness, f.o.b. Glasgow	54/6
No. 1 Summerlee, " "	53/
No. 1 Gartsherrie, " "	51/6
No. 1 Langloan, " "	58/6
No. 1 Carnbroe, " "	46/6
No. 1 Shotts, " at Leith	52/6
No. 1 Glengarnock, " Ardrossan	51/6
No. 1 Dalmellington, " "	45/
No. 1 Eglinton, " "	43/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

**Cleveland Pig.**—The market is very quiet, with buyers and sellers apart. No. 3 Middlesborough quoted 38/6 @ 39/6, prompt.

**Bessemer Pig.**—In this line there continues to be a good trade at firm prices. West Coast brands, mixed numbers, 49/6, f.o.b. shipping point.

**Spiegeleisen.**—The demand continues fairly active, and prices are strong. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

**Steel Rails.**—The demand is good and the market very firm. Heavy sections quoted at £4. 12/6, and light sections £4. 17/6 @ £5. 2/6, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—There is a good demand and prices remain firm. We quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Prices as before and market firm, with demand good. Bessemer, 2½ x 2½ inch, £4. 5/, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Not much doing in these, but prices firmly held. Bessemer, £4. 5/, f.o.b. at N. W. England shipping point.

**Old Rails.**—The market firm but quiet. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap-Iron.**—Dealings moderate, but prices firm. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—Moderate sales at unchanged prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin-Plate.**—More business passing and the market showing better tone. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @
IC Siemens	14/ @
IC Coke, B. V. grade	13/ @
Charcoal Terne, Dean grade	12/ @ 12/3

**Manufactured Iron.**—Business rather quiet, but prices quite firm. We quote, f.o.b. Liverpool:

Staff. Marked Bars	£ s. d.	£ s. d.
Common	8 2 6	5 17 6
Staff. Bl'k Sheet, singles	7 12 6	7 15 0
Welsh Bars (f.o.b. Wales)	5 5 0	5 7 6

**Copper.**—A very good business done, but at irregular prices. To-day's prices for Bars were £41. 10/, spot; £41. 5/, three months' futures. Best Selected, £48.

**Tin.**—Transactions on a larger scale and irregular but firmer prices. Straits quoted to-day at £91. /10, spot, and £92. 5/ for three months' futures.

**Lead.**—The market very quiet and prices barely steady. Quoted £12. 10/ for Soft Spanish.

**Spelter.**—Demand moderate but the market steady. Quoted at £18 for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	10.5
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	51.08
Milreis (Brazil)	54.6
Mark (Germany)	23.8
Kilogram	2.205
Picul	134

### EAST INDIES.

**MANILA, June 3, 1889.**—**Hemp.**—There are buyers at \$15.75 per picul, as compared with \$8.12½ same date last year, equaling per ton, cost and freight, \$250, against £27.15/. Clearances for the United States since January 1 sum up 109,000 bales, against 76,000 same time last year; loading for do., 23,000, against 16,000. Cleared for England since January 1, 111,000 bales, against 137,000; loading, 10,000, against 11,000. Cleared for all other ports, 20,000, against 36,000; receipts at all ports since last cable, 7000, against 9000, and since January 1, 258,000 bales, against as many last year and 200,000 in 1887. **Freight.**—\$7.50, against \$5.50. **Exchange.**—Six months' sight, 3/5, against 3/5½. **Ker & Co.,** per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.

**COLOMBO, Ceylon, April 26, 1889.**—**Plumbago.**—Our market has remained firmly sustained at the following quotations in rupees per ton: Large lumps, 145 @ 170; ordinary lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 55. Shipments since October 1 have been as follows: To England, 86,144 cwt.; to Hamburg, 6206; to Antwerp, 6097; to Bremen, 659; to Holland, 437; to India, 96; to Australia, 203, and to the United States 76,340—altogether, 176,182, cwt., against 143,620 in 1888, 126,278 in 1887 and 108,078 in 1886. **Cair Yarn.**—Has been steady at 7 @ 13 rupees per cwt. **Exchange.**—1/4 9-16, six months' sight, credit drafts. **Volkart Bros.** through their agent in New York, Mr. John W. Greene, 83 Wall street, New York.

### CHINA.

**HONG KONG, May 3, 1889.**—**Petroleum.**—The aspect of the market is unchanged. Prices for spot cargo hold their own despite the slack demand. We quote, \$2.30 @ 2.35 per case, Comet, and \$2.25 @ \$2.27½ per case, Stella brand. It is impossible to furnish a reliable quotation for cargoes to arrive, there being no buyers at any reasonable rate owing to the heavy supplies afloat. A larger portion of the cargo per Titan, in more or less damaged condition is being sold at auction, and it is feared that this sale will further depress the market. **Vermilion.**—\$47 per box of 50 cattie. **Exchange.**—Firm at 3/9½, for four months' credit drafts. **Arnhold, Karberg & Co.**

### SPAIN.

**BILBAO, May 18, 1889.**—**Iron Ore.**—Transactions have been confined for the week to single cargoes at 8/4 @ 8/8 Campanil, 7/ @ 7/3 Rubios, and 6/7 @ 6/9 inferior. Steamers in search of cargo have become scarcer. The English coal trade absorbing a good many at present; the freight to England is 6/10½ and to Holland 7/10½, showing an advance in a couple of days of 1½d. Total shipments since January 1 aggregate 1,558,820 tons, against 1,481,791 in 1888. **Pig-Iron.**—Shipments to Italy during the week reached 5342 tons and coastwise 380. May 25.—This has been a dull week in Ores, without change in prices, but with an easier tendency in freight rates. Export of Iron Ore to date, 1,624,245 tons, against 1,540,736 in 1888. Of Pig-Iron only 483 tons went coastwise. **Bilbao Maritimo y Comercial.**

William F. Jarvis, of the firm of William F. Jarvis & Co., Detroit, Mich., has just returned home after several months' absence in Europe.

## Hardware.

While the market is without special feature, there is a fair business doing and the impression prevails that trade continues pretty satisfactory for the time of year. Prices are without material alteration and are still characterized by a rather weak tone, but there are indications in certain directions of a slight improvement and in the trade there seems to be a hopeful feeling. The very satisfactory reports received in regard to the condition of business throughout the country and the prospects for large crops tend to produce the expectation that there will be a good summer's and a fine fall business.

### Wire Nails.

The new card has been adopted by the principal manufacturers, but the part relating to the miscellaneous goods has not been adopted by the principal Tack-makers and some others who do not make the standard Nails. The card as a whole is, however, received by the trade generally with a good deal of favor, and it appears likely that it will come into general use. The trade refer to the convenience under it in obtaining quotations or making purchases without regard to the assortment, and also appreciate the effort of the manufacturers in the part of the list relating to Miscellaneous Nails to check the tendency to carry an unnecessary number of sizes, as the new card tends to make the designated sizes the standard sizes to the sale of which trade will naturally drift. There is, however, some question as to the manufacturers' prices on special sizes not designated in the card. Since its adoption by the manufacturers there has not been a heavy amount of business done, but the transactions that have taken place indicate that the card price will remain about as heretofore under the old card, namely, on a basis of \$2.25 per keg in carload lots at factory.

### Cut Nails.

A large business is in progress and the impression is strengthening that an improvement in the condition of this branch of the Iron trade is near at hand. Quite a speculative movement has developed, parties having made overtures for the purchase of large quantities with this end in view. Such orders have been refused by several of the manufacturers' agents, and it is not known that any of them were found willing to make sales of this character. They are cautiously handling the trade coming to them, as stocks here are not heavy and a large number of the factories are not in shape to speedily replenish them. The works in Central Pennsylvania which have not been damaged by the flood have had their soft-coal supply cut off by the interruption to the railroad service, so that the output of Nails is being more curtailed than had been anticipated. Dealers in this section are known to be carrying very light stocks also, and if any considerable proportion of them were to enter the market to stock up the effect on prices would be marked. In a small way prices have already been advanced 5 cents per keg, but quotations for quantity have not been changed from \$1.80 to \$1.90 for Iron Nails, although indications of an upward movement are more promising than have appeared for a long time.

### Ammunition.

There have as yet been few recent developments in this field and matters are apparently moving on about as heretofore. There are, however, some features in the situation that make it interesting and may before long materially alter the existing condition of things. The Ammunition

Manufacturers' Association, under its present arrangements, which are recognized as skillfully devised and efficiently carried out, are succeeding in controlling to a good degree the prices of their goods, and are thus securing to themselves and the jobbers satisfactory margins. The method by which the special houses are given stipulated sums in lieu of commissions, as heretofore, is in general working very well, though it is understood that there is some dissatisfaction on the part of these houses in regard to the amount paid them, which is not in all cases proportioned to the amount of goods sold by them under the former system. There are also intimations that these houses, while their remuneration does not depend upon the amount of Ammunition at present sold by them—the policy of the association being by its present arrangement to check the recent tendency by which a constantly increasing proportion of goods was marketed by these specials—are desirous of holding their trade, and are in some cases in one way or another offering inducements to the trade to purchase from them. The general situation is, however, so far as the Ammunition Association is in these respects concerned, quite satisfactory.

There is, however, some uncertainty in regard to the future of Powder and Loaded Paper Shells, and these two lines are at present connected in a way in which they have not heretofore been, so that it seems not unlikely that an entirely new factor will hereafter be found in the market, the effect of which may possibly be felt to a greater or less extent by the Ammunition Association.

The existing combination on Powder has been quite well maintained, and regularity to a good degree secured in prices. There are, however, rumors that some of the companies are dissatisfied with their allotment, and unless their demands are met it is thought that not unlikely there may be a disruption in the combination and a more or less active Powder war. The manufacturers will, however, make earnest efforts to avoid this, and it is quite possible that they may succeed in adjusting their interests satisfactorily to all concerned.

The simple matter of Loaded Paper Shells is, however, somewhat complicated, and directly connected as it is with the Powder manufacturers on the one side, and the Ammunition manufacturers, who make the Paper Shells, on the other, is not unlikely to be a disturbing element. It is a well known fact that these Loaded Shells have for the last few years been rapidly coming into favor, and it seems probable that they are to occupy a large place in the market and be very extensively used for sporting purposes. This fact has led some of the regular Ammunition manufacturers to put them on the market, and there has been between such manufacturers an eager but quiet competition for the sale of the goods. The manufacturers of Powder, on the other hand, recognizing the growing importance of this line, have, as we recently noticed, entered also on the manufacture of the goods and have threatened to become somewhat formidable competitors in the field. The fact that an opportunity would be thus given them for making a reputation for their Powder which would not be the case if the goods were made by other manufacturers was doubtless also a motive in inducing them to take this new departure, the empty Shells being purchased from the Ammunition companies. It would appear, however, that the latter did not regard this enterprise of the Powder manufacturers with satisfaction, and it is significant to note that within a short time they have made a change in their prices by which their Loaded Shells are offered at materially lower prices, while their

empty Paper Shells of second quality, the grade used in the Loaded Shells, are materially advanced, the new discount being made 20 and 10 per cent., instead of 33½ and 10 per cent., as heretofore. It is thought that this action was taken in part to discourage the Powder manufacturers in the manufacture of Loaded Shells, especially as it is understood that the association had previously indicated an unwillingness to sell the shells to them, making it necessary for the Powder companies to obtain the goods indirectly through parties in the trade.

The Powder companies, however, are possessed of abundant capital, and it is intimated are not disposed to be thwarted in what they regard as a legitimate enterprise by a little difficulty of this kind, and have accordingly, we are advised, been conferring as to the feasibility of making their own Paper Shells, reaching the conclusion, it is understood, that something could advantageously be done in this direction. It was accordingly more or less definitely decided to form a company for this purpose, in which some of the largest Powder companies in the country will be represented. The Powder manufacturers will thus be in position to manufacture Loaded Shells in accordance with their earlier plans, and perhaps on an enlarged scale.

It remains to be seen precisely how this new enterprise, which we understand has taken somewhat definite form, will be carried out, and to what extent it will affect the Ammunition market. The price of the Loaded Shells is now irregular and some parties, especially in the West, are offering the goods at exceptionally low figures. It is obvious that this new departure, if it should be entered upon, might have an important bearing on other lines, as the Powder companies if they should see fit might become important competitors in the Ammunition field.

### Miscellaneous Prices.

The following is the price-list of the Standard Fiber Ware Company, Mankato, Minn., and 173 and 175 Adams street, Chicago, Ill. It will be observed that most of the goods are made in two styles, plain and decorated, prices being given for both:

Articles.	—Per dozen.—	
	Plain.	Decorated.
Water-Pails, 12-quart.	\$4.00	\$4.50
Dairy-Pails, 14-quart.	4.50	5.00
Fire-Pails—No. 1, 12-quart; No. 2, 14-quart.	4.50	5.00
Sugar-Pails (with cover).	6.00	6.50
Chamber-Pails—No. 1, 12-quart; No. 5, 14-quart.	6.50	7.50
Slop Pails—No. 1, 12-quart; No. 5, 14-quart.	6.50	7.50
Commode Pails—No. 1, 12-quart; No. 5, 14-quart.	6.50	7.50
Slop Jars (balance trap)—No. 5, 14-quart.	8.00	9.00
Commode Rings.	1.50	1.50
Wash-Basins, 10½-inch.	2.00	2.25
Wash-Basins, 12-inch.	2.25	2.75
Wash-Basins, 13½-inch.	2.75	3.25
Wash-Basins, 15-inch.	3.25	3.75
Fruit-Bowls.	2.00	2.50
Servers, 12-inch.	2.00	2.50
Keelers, 11¼-inch.	4.00	4.00
Waste-Paper Baskets, 18 inches high.	6.00	6.00
Mats, 9 inches (for table use).	1.00	1.25
Mats, 15 inches (for Cuspidors, &c.).	3.00	3.50
Mats, 17 inches (for Slop Jars, Spittoons, &c.).	3.50	4.00
Mats, 20 inches (for Slop Jars, Spittoons, &c.).	4.00	4.50
Cuspidors.	8.00	8.00
Cuspidors and 15-inch Mat combined.	11.00	11.00
Spittoons, Daisy, 8-inch.	4.00	4.50
Spittoons, 10-inch and 11-inch.	6.00	6.50
Peck Measure.	4.00	4.00
Half-peck Measure.	3.50	3.50

### Items.

A decision has been rendered by Judge Blodgett, of the United States Circuit Court, in the suit brought by the Coleman Hardware Company, Chicago, Ill., against the Pullman Sash Balance Company, Rochester, N. Y., for an injunction to restrain the latter from manufacturing or selling their Sash Balance. This injunction, we

are advised, was granted, the court holding in substance that the class of inventions in question was not new, but that the matter of the brake, as covered by the Coleman Hardware Company's patent, the Shumard, was new and meritorious, and that there was no essential difference between the brake covered by their patent and the one used by the Pullman Sash Balance Company.

New Haven Copper Company, 294 Pearl street, New York, announce that they have withdrawn the agency for the sale of their well-known Augers and Bits and are now selling the goods themselves at the above address. More detailed information in regard to their manufactures is given in their advertisement on page 49.

Fulton, Conway & Co., Louisville, Ky., general Hardware dealers and manufacturers of Hubs, Spokes and Felloes, report that May was the largest and most successful month of their entire business experience. They have a fine local trade, and do a large jobbing business, principally south of the Ohio River and running down into the cotton region.

The Brinkerhoff Company, Auburn, N. Y., are manufacturing the Crown Trolling Spoon, which is so constructed that the hook is so protected that it is prevented from catching in grass or other obstructions in the water, while at the same time it is in such a position that when seized by the fish it is at once exposed and ready for effective work.

A. C. Parker & Co., Memphis, Tenn., issue a new edition of their circular relating to the Parker Elevator Purifying Pump, giving a description of it and pointing out its advantages.

V. A. Avery, for several years past book-keeper with Esberg, Bachman & Co., Portland, Ore., has purchased an interest in the business of Dayton & Hall, of that city, the firm name being Dayton, Hall & Avery.

The Westphal-Hinds Hardware Company, Dubuque, Iowa, reorganized on the 5th inst. by electing the following Board of Directors: President, C. H. Kingman; general manager, G. B. Mansfield; directors, L. Fockler, M. R. Amsden, C. J. Lasure; secretary, C. D. Scott.

In their announcement on page 49 the Westphal-Hinds Hardware Company, Dubuque, Iowa, offer their entire line of Wagon and Carriage Makers' Hardware and Wood Stock, the trade for which has been established for 30 years. Their reason for selling is because they intend to confine themselves to General and Shelf Hardware exclusively.

The partnership heretofore existing between L. E. McKinnon and A. L. Mitchell under the name of McKinnon & Mitchell, St. Catharines, Ont., has been dissolved. The manufacturing business in Carriage Dashes and Hardware will hereafter be carried on by L. E. McKinnon under the name of McKinnon Dash and Hardware Company, and the importing and jobbing business in Carriage Hardware, Trimmings, &c., will be carried on by A. L. Mitchell under the name of A. L. Mitchell & Co.

The Iowa Farming Tool Company, Fort Madison, Iowa, issue circulars calling attention to their Prize Grain Cradle, in which a description is given of it and its advantages pointed out.

Hoag & Titchener, Binghamton, N. Y., issue a convenient illustrated catalogue of Double-Pointed Tacks, Wire Nails, &c., of their manufacture. They direct particular attention to their Blind Staples, which have been a specialty with them for a number of years, and to the quality of which they refer. Their chisel-pointed

Staples are in use by some of the largest mills in the country, and are referred to as especially desirable for hard-wood Slats.

In his announcement signed "D," Box 212, care of *The Iron Age*, a gentleman widely known to the trade and with excellent connections states that he is open to make an engagement with some manufacturer of Heavy Hardware, Metals or Tools of established reputation for the purpose of representing them to the large buyers in the Eastern or Western States.

In his advertisement on page 62 Walter Hart, 22 Warren street, New York, calls attention to the National Flagstaff Bracket, of which an illustration is given. The fact that this Bracket was in especial demand during the Centennial celebration in this city is alluded to, and as the Fourth of July approaches it will doubtless be in further requisition.

Sargent & Co. desire to call attention to the fact that the Chic Door Check is intended especially for Screen Doors such as are worked with ordinary single-acting spring hinges or light screen-door springs. They accordingly should not be used upon wooden doors nor with heavy door-springs of any kind.

The Central Hardware Co., Philadelphia, are putting on the market a line of Brass and Wrought-Iron Hardware, which is illustrated in a catalogue and price-list of recent date. It covers Cast-Brass Hinges, Refrigerator Hinges, Hasps and Butts and an extensive variety of Wrought-Iron Goods.

Pelton, Rau & Sibley, Philadelphia, Pa., issue convenient and comprehensive price-lists of Varnishes, Japans and Fine Colors, which they are now offering as importers and manufacturers. These price-lists are issued in two forms, one being with prices for dealers only.

It is reported that executions for a small amount have been issued against the Nimick & Brittan Mfg. Company, of Pittsburgh, manufacturers of Builders' Hardware, but we are informed by the secretary of the company that none of the creditors will lose anything, but that the indebtedness of the company will be paid in full. The works of the firm have been idle for some months, and, as a result, the firm have been losing money, and the stockholders have decided to reorganize the company as soon as possible. When this is done the plant will again be put in operation.

#### The Hardware Houses at Johnstown, Pa.

The hardware interests of Johnstown, Pa., suffered severely in the calamity which recently overwhelmed that city. The Hardware houses of prominence were three in number, as follows: John Dibert, whose capital was rated at \$75,000 to \$125,000; Jacob Swank, Son & Co., \$40,000 to \$75,000; Bentley & Fronheiser, \$20,000 to \$40,000. John Dibert and Jacob Swank are reported to have fallen victims to the flood, while the other Hardware merchants escaped. Their stocks of goods were submerged in all cases, and the buildings badly damaged, so that the financial loss of the several concerns will be heavy. All of these establishments were well managed; all did a prosperous business, and their credit stood high. Jacob Swank, Son & Co. had recently extended their operations into the wholesale field, and promised to develop into one of the most enterprising houses in their section of the State. The Stove and Tinware merchants also suffered heavily, both in loss of life and property. Frank W. Hay & Son had one of the largest Tin-shops in Western Pennsylvania, and carried a very heavy stock of Tin-Plate and Tinware. The building has

been utterly obliterated. The senior member of this firm was the first subscriber to *The Iron Age* in Johnstown and has continued on our list up to this time.

#### Help for the Pennsylvania Sufferers.

At the special meeting of the Hardware trade of Philadelphia, held at their room, 912 Drexel Building, June 4, the following committees were appointed to solicit aid for the Johnstown sufferers:

**Jobbers' Committee.**—Chas. M. Biddle, 507 Commerce street; John R. Griffiths, 119 North Third street; Chas. M. Ghriakey, 506 Commerce street.

**Manufacturers' Committee.**—T. Henry Asbury, Third and Dauphin streets; Hugh McCaffrey, 1839 North Fifth street; Thomas Devlin, Lehigh avenue and American street; Fayette R. Plumb, Frankford, Pa.; Samuel Diston, Tacony, Pa.

**Retailers' Committee.**—E. W. Richards, 2029 Frankford avenue; Chas. McFadden, 1025 Market street; Wm. J. Framer, 1921 Market street; Samuel P. Swoope, 3800 Market street; Henry Gildemeyer, 927 Girard avenue; Paul J. Devitt, 1107 South Second street; Henry Stutz, Jr., 4809 Germantown avenue; E. F. Wagner, 838 Richmond street; J. L. Kinkarter, 4773 Frankford avenue.

As the result of the efforts of these committees the following amounts were contributed:

Through the Retailers' Committee....	\$906.55
Through the Manufacturers' Committee.....	2587.41
Through the Jobbers' Committee.....	2389.25
Total.....	\$6413.21

There was previously sent to Drexel & Co. \$3274, making a total of \$9687.21. Of this first contribution we are advised that Henry Disston & Sons and their employees gave more than \$2000. There were also contributions in merchandise: Beuler, Bonbright & Co., sundry Hardware amounting to \$175; Geo. Griffiths Company, 200 Shovels; and Barrows-Savery Company, 200 Pots and Kettles. The following list gives the names and amounts of the various contributors:

W. J. Cramer & Co.....	\$20.00
C. H. Ulmer.....	20.00
Joseph H. Hutchinson.....	5.00
T. W. Manship.....	10.00
Thomas Devlin & Co.....	100.00
W. H. & G. W. Allen.....	100.00
Philadelphia Cutlery Co.....	25.00
E. W. Richards.....	20.00
Weber Bros.....	20.00
R. Nuttall & Son.....	25.00
Brewer Bros.....	10.00
Millard Hickey.....	5.00
J. B. Carter.....	25.00
Hildebrand & Wolf.....	25.00
Smith-Seltzer Hardware Co.....	100.00
Russell & Erwin Mfg. Co.....	100.00
Myers & Ervien.....	100.00
C. E. Burk.....	10.00
Pope & Stevens.....	10.00
Hicks & Dickey.....	25.00
James Boyd & Bro.....	50.00
C. J. Field.....	25.00
James M. Vance & Co.....	100.00
Rogers & Miller.....	25.00
Newlin, Knight & Co.....	250.00
Cumberland Nail and Iron Co.....	100.00
Lucy Pritchard.....	10.00
Strawbridge & Chase.....	100.00
W. H. Bennett & Co.....	25.00
Getze & Bro.....	25.00
G. M. Ghriakey.....	100.00
E. E. McCargo.....	25.00
A. B. Shipley & Son.....	20.00
T. James Fernley.....	20.00
J. R. Paulson.....	25.00
S. J. Goodall.....	10.00
Benedict & Burnham Mfg. Co.....	100.00
R. W. Truitt & Co.....	25.00
W. P. Walter's Sons.....	20.00
Shields & Bro.....	200.00
W. B. Sowers.....	100.00
Powell & Maddock.....	10.00
G. T. Sutlerly & Co.....	10.00
Daniel Kelly.....	10.00
Lloyd & Supplies Hardware Co.....	200.00
Biddle Hardware Co.....	200.00
J. P. Brosius.....	25.00
Wm. Wiler.....	5.00
Palmer, Cunningham & Co.....	100.00
G. W. Van Tine & Son.....	50.00
A. R. Justice.....	25.00
Employees Biddle Hardware Co.....	201.73
DeWitt Wire Cloth Co.....	50.00
Smith Harper.....	50.00
M. Rowland & Co.....	25.00

Charles Rowland	\$5.00
Duncannon Iron Co.	50.00
Boyer, Evans, Cascaden & Co.	20.00
W. Coverdale	5.00
Swope & Lloyd	25.00
M. DeHaven	10.00
George C. Rodgers	5.00
H. C. Ghriakey	5.03
W. H. Ashmore	5.00
Charles E. Van Roden	5.00
Jacob D. Rodgers	5.00
J. G. R. Rodgers	5.00
Tuttle & Co.	5.00
Richard B. Massam	5.00
Evan Jones	5.00
George W. Palmer	5.00
W. W. Murray	5.00
J. & J. H. Bing	15.00
J. & J. H. Bing's employees	15.00
Mrs. W. P. Brenze	5.00
T. W. Blackmore	1.00
Joseph Heath	1.00
George Savage	1.00
James Wilson	1.00
Charles F. Brown	1.00
W. F. Ritter	1.00
W. A. Scott	1.00
Charles H. Wistar	1.00
Charles J. Lutterell	1.00
W. W. McCausland	1.00
W. H. Bruner	1.00
C. Wilton Swope	1.00
W. P. Brenze & Co.	10.00
W. P. Brenze & Co.'s employees	15.00
Tacony Iron and Metal Co.	100.00
Fayette R. Plumb	50.00
Fayette R. Plumb's employees	146.25
Enterprise Mfg. Co.	500.00
Enterprise Mfg. Co.'s employees	373.56
Thos. Devlin & Co.'s employees	130.75
Employees of McCaffrey Bros.	80.35
Job T. Pugh	25.00
Shable & Kleem	50.00
J. Hall Rohrman & Sons	25.00
W. McNiece & Son	25.00
Stanley G. Flagg & Co.	150.00
Diller, Caskey & Co.	50.00
Steel, Van Rossum & Co.	25.00
John M. Melloy's Sons	25.00
Philadelphia Hardware and Malleable Iron Works	25.00
Est. Harriet S. Ogden	25.00
Glover Bros.	10.00
Henry Freeman	25.00
T. Rowland's Sons	100.00
Employees of Lloyd & Supplee Hardware Co.	81.50
McFadden & Co.	150.00
Murta, Appleton & Co.	10.00
James Peters	25.00
R. J. Alford	10.00
Jos. S. Fisher	25.00
Maharg Bros.	25.00
T. Pierce Buckley	5.00
Cash	8.00
Henry Gildemeyer	10.00
Brown Bros.	5.00
L. F. Seeger	10.00
H. Schwemmer	5.00
James Irvin	.50
F. P. Leggett	5.00
W. H. Moss	10.00
A. A. Duer	5.00
S. Lippman	.50
E. Yhost	1.00
George W. Nock	1.00
J. E. Fricke & Co.	1.00
A. L. Devitt	5.00
Mrs. A. Harley	2.00
S. S. Raser	10.00
Barrows, Savery & Co.	10.00
Henry Stutz, Jr.	5.00
Thomas A. La Motte	10.00
Employees of Brewer Bros.	5.50
S. L. Allen & Co.	50.00
Fairbanks & Co.	200.00
John B. Howe	2.00
Paul J. Devitt	5.00
J. J. Shannon & Co.	25.00
M. Middleton & Co.	20.00
J. Heston Smith & Co.	5.00
Employees Miller Lock Co.	34.00
E. F. Wagner	50.00
C. Kull	2.00
T. C. Ulmer	2.00
F. Glaser, Jr.	5.00
Cash	1.00
J. K. Johnson	5.00
Palmer Street School	1.80
Employees Newlin Knight Co.	25.00
Anna M. Biddle	25.00
Sarah Mitchell	1.00
Mrs. S. F., an old lady 96 years old	20.00
Wm. Adams & Co. and employees	71.50
Employees W. H. & G. W. Allen	20.00
McFadden	2.00

Since the receipt of the above Chas. M. Biddle reports the following additional subscriptions:

Bevin Bros. Mfg. Co., East Hampton, Conn.	\$25.00
J. B. Shannon & Sons, Philadelphia, Pa.	50.00
Pike Mfg. Co., Pike Station, N. H.	200.00

The wholesale and retail Hardware dealers in Boston have subscribed the following amounts for the relief of the sufferers by the late flood in Pennsylvania:

Bigelow & Dowse	\$100.00
41 Employees of Bigelow & Dowse	32.00
Brooks, Baldwin & Robbins	50.00
Bolles, Kimball & Wilde	50.00
Frye, Phipps & Co.	50.00
M. C. Warren & Co.	25.00
J. W. Vinal & Co.	25.00
Burditt & Williams	25.00
John Herbert, 20 Dock square	5.00
William Noble & Sons	10.00
George Allen	5.00
Goodnow & Wightman	10.00
A. J. Wilkinson & Co.	25.00
Chandler & Farquhar	5.00
Cutler, Woodrough & Co.	25.00
John Wales & Co.	50.00
Chandler & Barber	10.00
Curry & Hamner	10.00
A. M. Gardner	10.00
J. B. Hunter & Co.	10.00
Butts & Ordway	5.00

Total.....\$537.00

A. T. Young, agent of the Yale Lock Company, is deserving of credit for his exertions in making this collection. Some of the wholesale dealers sent their donations direct, and some of the retail dealers subscribed through other sources, so that this list does not show the full amount paid by the Hardware trade. It will be observed that the employees of Bigelow & Dowse contributed \$32, of which a statement of the individual subscriptions has been sent us. This collection was taken, we are advised, at their own suggestion, and their action will be regarded as very commendable and as setting an example that the employees of other large houses might advantageously follow.

The following additional subscriptions in aid of the sufferers by the flood in Johnstown and vicinity are reported by the Hardware Board of Trade, 4 and 6 Warren street, New York:

Eaton, Cole & Burnham Company	\$100.00
Benedict & Burnham Mfg. Company	100.00
Waterbury Brass Company	100.00
Plume & Atwood Mfg. Company	100.00
Holmes, Booth & Haydens	100.00
Bristol Brass and Clock Company	100.00
Manhattan Brass Company	100.00
Edward Miller Company	100.00
The Okonite Company	50.00
Employees of Schoverling, Daly & Gales	44.00
J. H. Lau & Co.	25.00
Graef Cutlery Company	25.00
John G. Witte & Bro.	20.00
Employees of Stanley Rule and Level Company	17.50
Sise, Gibson & Co.	10.00
Ely & Wray	10.00
"Friends"	10.00
Wm. Oliphant	5.00
Thos. D. Cunningham	5.00
Pierce & Thomas	5.00
Cash	5.00

Total.....\$1,031.50

Amount previously acknowledged.... 1,135.00

Total.....\$2,166.50

### Mississippi and Missouri Valley Hardware Association.

This association held an interesting and enjoyable session in Omaha June 4 and 5. Apart from the business of the association one of the very enjoyable features was the banquet which was given to the members by the jobbers of Omaha, the menu for which was unique and very tastefully gotten up. Its first page represents in outline a keg of Wire Nails, and bears as a motto, "We'll Open a Keg of Nails, Boys." The menu, printed on handsome satin ribbon, represents a high order of cuisine, and occupies the third page, to which it is pinned by a Wire Nail. The second page is of more than passing interest, and we accordingly reproduce it in full:

#### WHAT THE POETS SAY OF US.

How many a vulgar Cato has compelled His energies, no longer tameless then, To mold a pin or fabricate a nail!  
—SHELLEY—*Queen Mab*.

As one nail by strength drives out another,  
So the remembrance of any former love Is by a newer object quite forgotten.  
—Two Gentlemen of Verona.

Screw your courage to the sticking place!  
—Macbeth.

Thy combined locks to part.  
—Hamlet.

Ah, me! What perils do environ  
The man that meddles with cold iron.  
—BUTLER—*Hudibras*.

Give them great meals of beef, and iron and steel,  
they will eat like wolves.  
—Henry V, Act III.

And the smith his own measures hammered to the anvil's chime.  
—LONGFELLOW.

If they cannot cut, it may be said  
His saws are toothless, and his hatchets lead.  
—POPE—*Epilogue to Satires*.

The carpenter dresses his plank—the tongue Of his fore-plane whistles its wild ascending lisp.  
—WALT WHITMAN—*Leaves of Grass*.

No sound of hammer or of saw was there.  
—COWPER—*The Task*.

Thou shalt be whipped with wire.  
—Antony and Cleopatra.

A slave that keeps the keys.  
—D. M. MULOCK.

Put golden padlocks on Truth's lips.  
—LOWELL.

The spade, the ploughshare and the rake.  
—COWLEY.

Cast forth thy plummet.  
—QUARLES.

Put your trust in God, but mind to keep your powder dry.  
—EDWARD HAYES—*Ballads of Ireland*.

One of the novel features of the entertainment accorded to the visitors by the hospitable Hardwaremen of Omaha was a trip through the city, visiting all its prominent points, on two Concord coaches, each drawn by six horses. This, we are advised, was a very enjoyable affair, which was fully appreciated by the association.

### E. D. Clapp.

The widely-known manufacturer of Carriage Hardware, E. D. Clapp, died in Auburn on the 9th inst., after a short illness, aged 61 years. As early as 1852, or long before the era of large wagon factories, he was a strong advocate of the plan of building wagons on a large scale by machinery. He foresaw the vast importance such a system of manufacture would attain in competition with the hand methods then in use. Since 1856 Mr. Clapp has been one of the most active and successful business men in Auburn. In 1864 he procured a patent on a Thill Coupling for vehicles, which soon secured for itself a large sale all over the country. This was the beginning in Auburn of manufacturing Carriage Hardware, which has grown to be the largest of its kind in the United States. In addition to the patent Thill Coupling, other lines of Carriage Forgings were from time to time introduced, until now the forging of Carriage Irons by hand in small blacksmith shops has practically ceased. The first die-sinker employed to make the tools for the Clapp Patent Thill Coupling was M. F. Van Patten, a mechanic of long experience, who has ever since been associated with Mr. Clapp as partner and superintendent of all the manufacturing processes. In 1880 Mr. Clapp organized the Auburn Wrought Bit and Iron Company, with a capital of \$60,000, for the purpose of building and putting into operation a rolling-mill and machinery for manufacturing Bridle Bits. The next year the company were merged in the E. D. Clapp Mfg. Company, and the rolling-mill has since been almost exclusively em-



ployed to furnish iron for the Carriage Hardware of the latter company. In 1880 Mr. Clapp organized the E. D. Clapp Wagon Company, Limited, for the purpose of manufacturing Farm Wagons on a large scale by machinery. This system was attended with great success. In addition to his offices of president of the E. D. Clapp Mfg. Company and the E. D. Clapp Wagon Company, Limited, he was president of the National Association of Carriage Makers' Hardware and other organizations. The funeral will be attended Thursday, June 13, at 3 p.m., from the First Presbyterian Church, Auburn.

## REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

### Paints and Colors.

**White Lead.**—The event of the past week was the *entrée* of the Collier Company, the Southern Company and the Eckstein Company, into the National Lead Trust. Officials of the trust, for reasons of their own (the anti-trust legislation in certain States doubtless being a prominent one), observe a certain degree of secrecy regarding the deal. Indirectly, or, rather, negatively, the fact is established that the companies referred to are in the trust, however, and that consolidation of interests now involves all but four or five of the 32 White Lead manufacturing establishments in the country, or 85 to 90 % of the entire output. The Atlantic remains neutral, as does also the Davis-Chambers and some smaller companies, all of whom, while maintaining their individuality, will very probably follow in the path cut out by the trust. It is also probable that the newly organized Standard White Lead Company will refrain from antagonistic policy. As for the trust management, it is more likely to be in the direction of earning a dividend upon its large capital than to war upon the few independent corrodors by "cutting" prices. Present prices for White Lead are relatively so high that ready-mixed paints come into steadily-increasing competition, and the probability of an advance being made is, therefore, extremely vague. In point of fact, present indications suggest that current prices will be maintained and also that rebates, free-delivery points, &c., will be no more liberal to the jobbing trade in the future than at the present time. The prominence of the Standard Oil interest in the Lead industry, it is asserted on good authority, is not so much from desire to monopolize the White Lead manufacture as to control the supply of Litharge. In explanation of this the fact is cited that the latter commodity has been found to be a valuable flux in the refining of Lima crude petroleum. The inference is that the Standard not only intends to be assured of an ample supply at practically its own prices, but that it seeks also to control the supply for purposes disadvantageous to rival refineries of the Ohio Oil. Inquiry among corrodors, however, elicits facts that throw some doubt around to the merit of this supposition. For example, it is asserted that works might be erected for the special manufacture of Litharge at comparatively small cost, and, furthermore, that the investment of a fraction of the capital employed in organizing the trust would suffice to provide all the Litharge that the Standard Oil Company, or they and other refineries combined, could possibly use.

With respect to business in White Lead there is little to report save that the popular city makes have found steady sale, while Western brands have been rather slower in this market. Prices remain firm at 7¢ for Lead in oil in lots of 500 lb or over.

**Zinc.**—The movement of American Zinc, while yet of very fair volume, has not been quite as free as during the preceding week. Supplies are offered in a conservative way and prices are held quite firmly. Foreign Zincs, dry and oil, are selling to a very fair extent, with prices and rebates the same as have been quoted for some time past.

**Colors.**—Paris Green manufacturers report a good steady movement, and the association rates are firmly maintained. Other Greens are also doing well. Reds generally continue to meet with fairly the average movement. Low grades of English Venetian Red and American ditto are a trifle irregular, but other Reds steady. Browns, Blacks and Blues sell at within the former range of prices and to a fair extent.

**Chalk** is rather weak at \$3 to \$3.10 for large lots, being in limited demand. **Whiting** is also rather slow, and while 45¢ for Common and 57½¢ for Gilders' are named as inside prices, it is intimated that business has been done at a shade less. There were rumors of supplies having been offered from abroad at prices equivalent to about \$2.75 laid down here, and bids of even \$2.62½ were said to have been solicited. These low figures, it was also stated, have led to offers of Common Whiting at as low as 40¢ @ 42½¢. For the present, however, there is neither business nor outright offers that would warrant placing reliance upon those quotations.

**Paris White** has continued to meet with very fair sale at prices within the range current heretofore.

**Barytes, Terra Alba and Talc** are without movement of importance at the moment, and show no change of importance in values.

### Oils.

**Linseed-Oil.**—The advanced prices noted last week are maintained and the general position of the market is unchanged. Seed continues rather scarce and high in price, compelling crushers to gauge their output closely to what the market will absorb. The use of substitutes continues as far as practicable, but pure Linseed product moves remarkably well despite that fact and its high cost.

**Lard-Oil.**—The present price of raw material and the comparatively good return received by pressers for their Stearine make Oil appear rather high at current figures. Leading city makes are well sold up, however, and in the absence of extensive offerings of Western brands no concessions are made except possibly on future deliveries to large buyers.

**Cotton-Seed Oil.**—Business in this line has been slow. The trust selling agents give no information to the contrary at all events, and outside sellers report few and generally small sales. Last week's prices are quoted, but the market looks rather easier, particularly for the off grades.

**Menhaden Oil.**—A large lot of Crude Menhaden has been purchased for export, 3000 barrels being involved. The price is not made public, but is understood to be very little if any above 25¢. The new fishing season will soon be inaugurated, pending which values are unsettled. The manufactured products are slow and rather weak.

**Cocoonut Oil** has been more active and is stronger. Some 200 tons of Cochin have been worked off at 6¢ @ 6½¢, and about 450 tons Ceylon at 5.40¢ @ 5½¢ to arrive and 5.45¢ @ 5½¢ on spot. Supplies are now concentrated. A ship with 800 tons aboard was reported wrecked.

## Wholesale Prices.

NEW YORK, June 12, 1889.

Oils.	
Linseed, City, raw.....per gal	60 @ ..
" " " " " " " " " "	63 @ ..
" " " " " " " " " "	58 @ 50
Lard, City, Extra Winter.....	60 @ 60
" " " " " " " " " "	56 @ 56
" " " " " " " " " "	54 @ 54
" " " " " " " " " "	48 @ 48
" " " " " " " " " "	55 @ 55
" " " " " " " " " "	39 @ 40
Cotton-seed, Crude, prime.....	35 @ 39
" " " " " " " " " "	48 @ 50
" " " " " " " " " "	45 @ 47
Sperm, Crude.....	70 @ 73
" " " " " " " " " "	75 @ 77
" " " " " " " " " "	76 @ 78
" " " " " " " " " "	81 @ 83
Whale, Crude.....	46 @ 48
" " " " " " " " " "	48 @ 50
" " " " " " " " " "	54 @ 55
See Elephant, Bleached Winter.....	28 @ 30
Menhaden, Crude, Sound.....	25 @ 27
" " " " " " " " " "	32 @ 34
" " " " " " " " " "	37 @ 38
" " " " " " " " " "	40 @ 41
Tallow, City, prime.....	40 @ 51
" " " " " " " " " "	40 @ 50
Cocoonut, Ceylon.....	54 @ 54
" " " " " " " " " "	54 @ 54
Cod, Domestic.....	34 @ 35
" " " " " " " " " "	35 @ 36
Red Blain, American.....	36 @ 38
Red Saponified.....	44 @ 5
Bank.....	29 @ 30
Straits.....	30 @ 31
Olive, Italian, bbls.....	65 @ 66
Neatsfoot, prime.....	62½ @ 75
Palm, prime, Lagos.....	64 @ ..

### Paints and Colors.

Barytes, Prime White.....	12.00 @ 20 ..
" " " " " " " " " "	12 @ 14
" " " " " " " " " "	19 @ 21
Blue, Celestial.....	54 @ 74
" " " " " " " " " "	45 @ 50
" " " " " " " " " "	20 @ 26
" " " " " " " " " "	7 @ 26
Brown, Spanish.....	3 ½ @ 1
" " " " " " " " " "	6 @ 8
Black, American Drop.....	8 @ 10
" " " " " " " " " "	12 @ 14
" " " " " " " " " "	25 @ 30
Black, Lamp, common.....	12 @ 18
" " " " " " " " " "	12 @ 25
" " " " " " " " " "	27 @ 28
Carmin, No. 40, in bulk.....	3.10 @ ..
" " " " " " " " " "	3.20 @ ..
" " " " " " " " " "	4.20 @ ..
Chalk.....	3.00 @ 3.25
China Clay, English.....	18.50 @ 18
" " " " " " " " " "	11.50 @ 11.50
Cobalt, English.....	2.00 @ 2.90
Crocus Martius, English.....	1 ½ @ 2 ½
" " " " " " " " " "	1 ½ @ 2 ½
Green, Paris, in bulk.....	20 @ ..
" " " " " " " " " "	20 ½ @ 20 ½
" " " " " " " " " "	22 @ 20 ½
" " " " " " " " " "	12 @ 13
" " " " " " " " " "	22 @ 25
Lead, American White, dry.....	6 ½ @ 7
" " " " " " " " " "	7 @ 7 ½
" " " " " " " " " "	6 ½ @ 7
Litharge, in casks.....	6 ½ @ ..
" " " " " " " " " "	6 ½ @ ..
" " " " " " " " " "	7 ½ @ ..
Ocher, Rochelle.....	1.37 ½ @ 1.55
" " " " " " " " " "	1 ½ @ 1 ½
" " " " " " " " " "	1 ½ @ 1 ½
" " " " " " " " " "	1 ½ @ 1 ½
Orange Mineral, English.....	8 ½ @ 9 ½
" " " " " " " " " "	8 ½ @ 9 ½
" " " " " " " " " "	8 @ 8 ½
Paris White, English Cliffstone.....	1.00 @ 1.10
" " " " " " " " " "	70 @ 85
Red, Indian, English.....	5 ½ @ 7
" " " " " " " " " "	9 @ 6
" " " " " " " " " "	9 @ 14
" " " " " " " " " "	9 ½ @ 11
" " " " " " " " " "	90 @ 1.25
" " " " " " " " " "	1.00 @ 1.47 ½
Sienna, Italian, Burnt and Powd. # 1.....	5 @ 6 ½
" " " " " " " " " "	14 @ 8 ½
" " " " " " " " " "	5 @ 6 ½
" " " " " " " " " "	2 @ 3 ½
" " " " " " " " " "	14 @ 14 ½
" " " " " " " " " "	14 @ 14 ½
Talc, French.....	1 ½ @ 1 ½
" " " " " " " " " "	1 @ 1 ½
Terra Alba, French.....	75 @ 80
" " " " " " " " " "	80 @ 85
" " " " " " " " " "	75 @ 75
" " " " " " " " " "	38 @ 40
Umber, Turkey, Bnt. and Powd., # 1.....	3 ½ @ 4
" " " " " " " " " "	2 ½ @ 3
" " " " " " " " " "	3 ½ @ 4
" " " " " " " " " "	2 ½ @ 2 ½
" " " " " " " " " "	14 @ 14 ½
" " " " " " " " " "	14 @ 14 ½
Yellow, Chrome.....	10 @ 25
Vermillion, American, Lead.....	11 ½ @ 13
" " " " " " " " " "	60 @ 65
" " " " " " " " " "	82 @ 85
" " " " " " " " " "	8 @ 25
" " " " " " " " " "	75 @ 77
" " " " " " " " " "	88 @ 90
Whiting, Common.....	45 @ 47 ½
" " " " " " " " " "	57 ½ @ 60
Zinc, American, dry.....	4 ½ @ 4 ½
" " " " " " " " " "	6 ½ @ ..
" " " " " " " " " "	7 ½ @ ..
" " " " " " " " " "	10 ½ @ 10 ½
" " " " " " " " " "	8 ½ @ 9 ½
" " " " " " " " " "	5 ½ @ 6

REBATES, &c.—White Lead. ½¢ rebate on purchases of 500 lb and over, if paid for within 60 days of date of invoice; terms, 60 days or a discount of 2½% if payment within 15 days from date of invoice. Extra rebate of ½¢ payable July 1 and December 31 to buyers of a total of 10 tons pure Lead during the year.

French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1¢; 25 bbls. 2¢; 50 bbls. 4¢. No discount allowed on less than 10 bbl. lots.

Paris Green.—Rebates to buyers of 500 to 1000 lb during season, ½¢; to buyers of 1000 to 2000 lb, 1¢; to buyers of 2000 to 4000 lb, 1½¢; to buyers of 4000 to 10,000 lb, 2¢; to buyers of 10,000 lb and over, 2½¢. Buyers of 5 tons or over at one time receive an additional ½¢.

Litharge.—Rebate of ½¢ for cash in 60 days and 2½¢ additional for cash in 15 days.

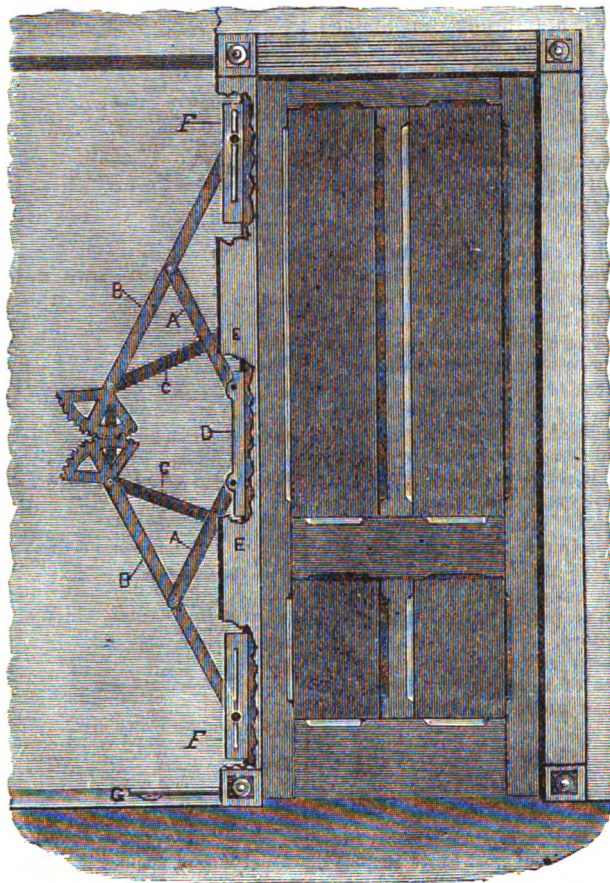
**Wilson's Sliding-Door Hanger.**

The Scranton Iron and Brass Company, of Nos. 1821-1829 Capouse avenue, Scranton, Pa., are directing the attention of those interested to the Wilson Sliding-Door Hanger, a general view of which is shown in the accompanying illustration. From an inspection of the cut it will be seen that neither rail nor track is required, and that it is unnecessary to cut or deface the door in order to place this hanger in position. The parts are strongly made of wrought-iron, with the exception of the geared portions, which are made of cast-iron. Before leaving the factory each

size special hangers are made to order. It is also claimed that a horizontal movement of the door is at all times secured; that it can never sag or get out of plumb, and that a door with this hanger can be readily hung and adjusted in a quarter of the time necessary to hang a door with wheel hangers and at one-fifth the cost.

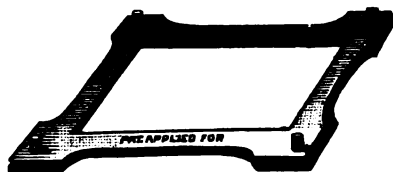
**Type-Writer Mat.**

The United Rubber Company, of Trenton, N. J., have brought out a mat for use under type-writers, for the purpose of reducing the noise to the lowest point. The mat is of soft rubber, with points for fit-

*Wilson's Sliding-Door Hanger.*

hanger is carefully fitted and tested. It is designed for use upon either right or left hand doors, as may be desired, the hanger being entirely concealed from view. Referring to the engraving, C is a bracket, which is readily secured to the studding and extends inward and parallel with the face of the door. Upon this bracket (C) and within the recess are pivoted, near the geared portions, the levers B B. To these levers are pivoted two arms shown at A A, which extend and are pivoted by their opposite ends to the plate D. This plate in turn is firmly secured to the edge of the door at or near its middle portion. The ends of the levers B B are each attached to a button made to slide perpendicularly in corresponding slots in the two plates F F, all of which are clearly shown in the cut. These plates are bent at right angles and are firmly secured to the edge of the door near its top and bottom. In case it is desired to make the door more steady at the top this may be done by the casing or by dowels, while the same result may be accomplished at the bottom by the floor guide indicated by G in the cut. The manufacturers state that the longer the hanger in proportion to the width of the door the easier it will move. In case the doors are too heavy for the length of hanger required and not of sufficient height to permit the use of the next

ting into the bottom frame of the machine in place of the small cushions furnished with the machine. The general appearance of the device is clearly indicated by the accompanying engraving. The advantages claimed by the manufacturers are, first, lessening the noise; second, securing an easier and more agreeable touch to the machine; third, keeping the machine level, and, fourth, saving wear and tear of the machine. The company have

*Type-Writer Mat.*

arranged to supply these mats for the different machines now in the market and to send them post-paid to any part of the country. This is a novelty well worthy of the attention of all users of office appliances.

The cotton acreage for 1889 is estimated by the *Financial Chronicle* at 20,809,480, which is an increase of 2.34 per cent. over the previous year. There is everywhere

a tendency to enlarge the cultivation of the plant, more especially in the richer lands of the Southwest. Georgia alone records a decrease

**Check-Rein Terret.**

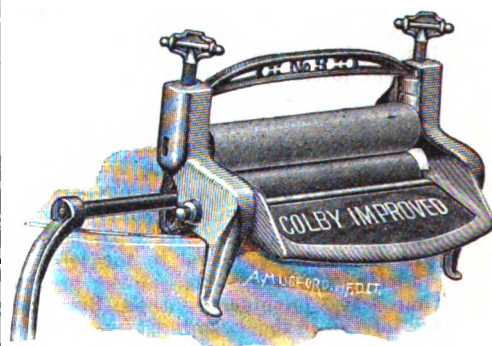
This terret is manufactured by Johnson & Colton, Montpelier, Vt. It is used on the hame-strap, and the advantages

*Check-Rein Terret.*

claimed for it are that it prevents the check-rein from wearing on the leather covering or plating on the hames, and also prevents the check-rein from catching under the shaft, thus causing accidents. It is also cheaper than the ivory or substitute for ivory rings now in use for the same purpose. It is referred to as being received with favor and meeting a want of the trade.

**The Colby Improved Wringer.**

The Colby Wringer Company, Montpelier, Vt., manufacturers of the well-known Premium wringers, are now putting on the market their Colby improved wringer,

*The Colby Improved Wringer.*

which is represented in the accompanying illustration, and which they claim possesses several advantages over other machines of this class. The frame is described as made wholly of malleable iron galvanized and the rolls of superior quality white rubber, vulcanized, not cemented, to the shaft. A novel feature to which they call attention is in the combination of a cam at each end of the apron with the inner leg or upright which clamps the wringer to the tub and a lever which raises and presses the lower against the upper roll. As a result of this construction the wringer can be removed from the tub without at the same time relieving the rolls of all pressure, thus securing their greater durability. The point is also made that as the frame is of malleable iron it is



possible to reduce the weight to a minimum with due regard to strength and durability. The wringers are fully warranted and the company agree to replace all defective parts.

#### H. M. Quackenbush's New Patent Nut-Crack.

This article is represented full size in the accompanying illustration and is manufactured by H. M. Quackenbush, Herkimer, N. Y. It will be perceived that the pattern is a modification of the nut-crack which he has been making for several years, which was made of square stock and

and then locked in position by its set-screw. This drill, which is made of steel, and the working parts of which are tempered, is manufactured by F. F. Waters Mfg. Company, of 88 Oliver street, Boston, Mass.

#### Standard Expanding Water-Conductor.

Armor, Marlin & Co., with office and factory at Nos. 206 and 208 Robinson street, Allegheny City, Pa., are offering the trade an expanding water conductor, made under the general name of Standard, a form of which we show in the accom-

panying them from becoming wet or soiled by the overflow of the eaves or heads. Each fastener, as will be seen from an inspection of the engravings, is provided



Fig. 2.—Fastener for Wood Walls.

with an opening to receive the fold of the conductor, and also with a screw, by which the conductor and fastener are united. The manufacturers claim that this form of construction prevents the



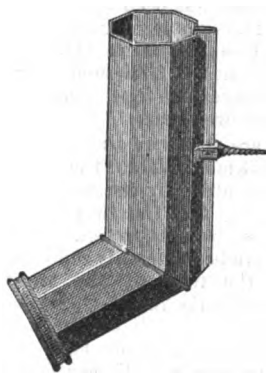
New Pattern Nut-Crack.

left square in the portion by which the nut is gripped. The new nut-crack has also special features which are covered by patents. The one represented above is made, it will be seen, of round stock and the lines are cylindrical throughout, thus making a material saving in the manufacture, as there is no loss of stock or time by turning down the handles, as required in the make of the square crack. As a result Mr. Quackenbush is enabled to place this crack on the market at a list price about one-third less than the square crack, although it is referred to as in every way as good, besides being pleasanter to handle, as there are no square corners. Another feature of this article which is covered by patent is the fact that the parts coming in contact with the nut are substantially cylindrical in form and the face of the serrated portion which holds the nut is narrower than the body of the jaw of the lever, whereby the sides of the jaws are caused to project beyond the bearing faces, and thus guard the fingers against injury. These goods are heavily nickel-plated and handsomely finished.

#### Friction Track Drill.

The friction track drill here illustrated has no lost motion, as the clutch is instantaneous; it is evident, therefore, that a

panying illustrations. This conductor is made of soft sheet-steel, galvanized, each section consisting of a single sheet 7 feet in length. Every pattern is made with a fold extending the entire length of



Standard Expanding Water-Conductor.—  
Fig. 1.—View of Section of Standard Expanding Water-Conductor.

each section, thus providing for expansion, and permitting the fastening inserted in the wall to be securely attached to it at any point. The longitudinal seam of these sections is so locked by the base of the fold that neither internal nor external

necessity for any hammering or jarring in the adjustment of the parts, while for convenience in shipping the sections may be nested, if the sizes will permit, and crated.

In Fig. 4 of the accompanying illustrations we show a section of eave-trough which this firm are also manufacturing.



Fig. 3.—Fastener for Brick Walls.

It is made of sheet-steel, galvanized, and put together with detachable couplings, a view of one of which is shown in Fig. 5 of the cuts. The eave-trough is made in 8-foot lengths without cross seams. The coupling is of simple construction, is easily connected with the eave-trough and



Fig. 4.—Eave-Trough, Showing Use of Adjustable Coupling.

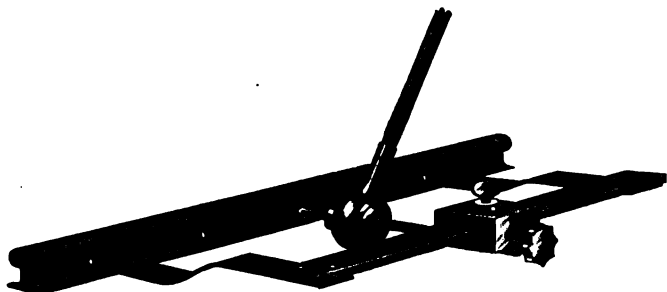
makes, it is said, a strong and perfectly water-tight joint without the use of either solder or rivets.

The statistics of lake commerce since the opening of navigation show that the formidable aggregate of previous years is being surpassed the present season. During the month of May a total of 1412 vessels passed through Sault Ste. Marie Canal, 936 of them being steamers. The total registered tonnage was 1,036,882 tons and total freight tonnage 907,237 tons. A



Fig. 5.—Eave-Trough Coupling.

comparative statement of canal traffic from the opening of navigation to June 1, 1889, shows registered tonnage 1,225,369 tons— increase over the same time in 1888, 744,484 tons; freight tonnage, 1,026,859 tons— increase, 396,200.



Smith's Friction Track Drill.

hole can be drilled in a rail with this tool in much less time than with a ratchet. The construction of the drill and the method of holding it to the rail are clearly brought out in the drawings. The feed-screw passes through a block which slides on a bar held parallel with the rail by two flat strips having hooked ends, which engage with the rail flange. The block may be moved to any desired point on the bar,

pressure on the conductor can open it. In Fig. 1 of the illustrations we show a section of an octagon conductor, Fig. 2 shows a fastener adapted for wood walls, while Fig. 3 is a fastener for brick walls. The fasteners are so constructed as to allow the fold of the conductor to expand in case of water freezing in it. The fasteners are of such shape and size as to keep the conductor from touching the walls, thus

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 11, 1889.

Assistant Secretary Tichenor has commenced the investigation of the testimony in the case of the lead-ore importations from Mexico. The views of the Treasury Department are evidently in the direction of carrying out the spirit of the law with reference to the importation and assessment of duties on lead ore.

It is claimed that while the object of the law was stimulation of the importation of silver ores into the United States, the same law contemplates a duty on lead ore, as that is provided at a specific rate in the statutes. The presence of a small amount of lead in silver ore, it is admitted at the Department, could hardly be interpreted as a violation of the statutes with reference to classification, as it is very rarely that silver ore is found without the presence of lead, but when lead bears so prominent a part as the metal of greater weight in the so-called silver ore its character becomes changed, and instead of silver ore free of duty becomes lead ore subject to a specific rate.

The amount of testimony submitted on both sides is enormous, and will require considerable patience on the part of Assistant Secretary Tichenor in order to compass all the arguments and statistics submitted by the opposing interests. The intention of the Assistant Secretary is to render a decision as soon as possible, and from present indications there is no reason to change the original statement that when the testimony is all examined a decision will be made in accordance with the spirit of the statutes. The Secretary's decision will classify certain grades of so-called silver ore under the provision for a duty of 1½ cents per pound on lead and lead dross. As the tariff will be a subject of legislation by the next Congress, the question at issue will be specially provided for, so that no further question of classification will be possible.

The Bethlehem Works, after about two years of energetic labor and a large expenditure of capital in getting their plant completed, having commenced the manufacturing of forgings for high-power guns, will now be kept very busy in supplying the armament for the three ships which are being constructed.

The Secretary of the Treasury has announced the following decisions in metallurgical cases:

Certain so-called tempered flat steel which, upon careful investigation, was found to consist of steel strips imported in coils varying from 300 to 500 feet in length, made from steel wire-rods, which are drawn to the requisite thickness and then cold-rolled, the same varying in their completed form from about ½ to 1 inch in width, and being 26 wire gauge or finer, used chiefly if not exclusively in the manufacture of corsets, and commercially known as "corset-wire," is held to be dutiable at the rate of 7 cents per pound, under provisions which impose a duty of 8 cents per pound on steel wire smaller than number 26 wire gauge, and 4 cents per pound additional on wire commonly known as "corset-wire."

Residuum from burnt pyrites, although imported in the form of bricks, is held to be dutiable at the rate of 75 cents per ton, under the provision for "iron ore," also the dross or residuum from burnt pyrites.

A chime of bells is not comprised within the terms "philosophical and scientific apparatus, instruments, and preparations," as contained in the free list, and is, therefore, not entitled to free entry, although imported for the use of a church.

## Restoration of the Cambria Iron-works.

The Johnstown correspondent of the Philadelphia Press writes on the 10th inst. as follows:

It has been said often enough before that the Cambria Iron Company meant Johnstown. To-day, in all that means local pluck in face of the great disaster, it can as truthfully be said that Johnstown means the Cambria Iron Company. But for the spirit shown by the Cambria Iron Company in inspiring local confidence the 20,000 odd survivors of Johnstown's 30,000 would to-day be sitting on the few curbstones that are left and lounging amid the ruins bewailing their lot, just as the Charleston people did ten days after the earthquake. The Cambria Company have done some of the most amazing things in the way of reconstructing the town. On Saturday night they had the natural gas mains under the river bed repaired, and the gas has been blazing there ever since. To-day the machine-shop, employing hundreds of men, is in operation. The boiler-shop is clanging with the hammers of a full force of workmen. The blacksmith shop is running full, and, what is more wonderful, the six blast-furnaces, with their small army of workmen, were started up this morning. This will not read in type like such a big accomplishment, and only those who have seen the utter undoing of these works by the flood can realize what a bound toward getting back to their former state has been taken by the company. The whole organization of the Cambria Company is in active operation. There are nearly 3000 men clearing away the wreckage and operating the departments that are open.

There are about two-thirds of the over 7000 workmen whom the company employed left alive by the flood. The mortality among the Cambria hands is fully as great as was expected. The Gautier hands have been steadily reporting day by day and the total of the survivors has swelled to nearly 700. If it reaches 700 that will be but half of the number formerly employed. The loss of men in the lower works will enable the other Cambria employees to get work whenever they want it. For the most part they are men who owned their little homes, which were swept away, and they are now endeavoring to provide quarters for their families.

It has been a rule of the Cambria Company to assist their men to own their own homes. Whenever a man has secured the ownership of a lot the company have loaned him money to build a house on it. The company years ago built many houses all through the town, and encouraged the men to buy them on easy terms. Now the policy will not change. Two million feet of lumber has already been ordered by the company for the men to use in rebuilding. The supply will be added to as rapidly as needed under Vice-President Powell Stackhouse's orders, and all the sawmills in this section will be kept busy if necessary.

What the Cambria Company have done, are doing, or intend to do will particularly interest Philadelphia people. Aside from the starting of the blast-furnaces, the machine, boiler and blacksmith shops, it is declared by the company that steel rails will be rolled before the end of June. A very careful examination of the new steel plant, made to-day by experts, showed that it was not injured. It had been completed shortly before the flood at a cost of \$300,000. No. 2 rolling-mill is nearly ready for work. The time office is open with full hands and is in full operation, as well as the draftsmen's room. The rod mill, which will be running in two days, will turn out 120 tons of finished material

a day. The blowing-engines of the blast-furnaces are being rapidly put in shape, and it has been ascertained that they were not badly injured. The general offices, which stood, while the Free Institute just across the street, which the company gave to Johnstown, went down, are already occupied by General Manager Fulton, General Superintendent Fronheiser and General Agent L. L. Smith.

The report which gained credence last week that General Manager Fulton was one of the victims of the flood was an error, as his many friends in the iron trade will be glad to know.

We are advised by telegraph from Pittsburgh, under date of the 12th, that the convention of the Amalgamated Association of Iron and Steel Workers was then still in session. The wage-scale had not yet been completed, but that it will be very little different from the present scale. Puddling will be \$5.50 on a 2-cent card. Nail cutting has been reduced about 38 per cent. for sizes under 4d, and 12½ per cent. for sizes above 4d.

Francis Alexandre, the founder of the steamship line to Cuba long associated with his name, died in this city on Saturday at the age of 81 years. He was born in the Isle of Jersey, settled in this city and engaged in the commission business. After this he became the owner of several vessels which composed the Alexandre Line and ran between here and Cuba and Mexico. He retired from business a few years ago, and for the past three years had been more or less of an invalid.

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# CURRENT HARDWARE PRICES.

JUNE 12, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, W 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmed Edge, 1-10's.....	65¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
1-10's, 70's.....	75¢
Double Waterproof, 1-10's.....	\$1.40
Musket Waterproof, 1-10's.....	50¢
G. D. ....	30¢
S. B. ....	30¢

Union Metallic Cartridge Co.	
F. L. Ground.....	50¢
F. L. Ground.....	55¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof.....	\$1.40
Dbl. Waterproof, in 1-10's.....	\$1.40

Eley's E. B. ....	45¢
Eley's D Waterproof, Central Fire.....	\$1.60
Cartridges	
Rim Fire Cartridges.....	50¢
Rim Fire Military.....	55¢
Cent. Fire, Pistol and Rifle.....	25¢
Cent. Fire, Military and Sporting.....	25¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 32 cal., \$3.50.....	2¢
Blank Cartridges, 32 cal., \$3.50.....	2¢
Primed Shells and Bullets.....	15¢
B. B. Cape, Round Ball, \$1.75.....	2¢
B. B. Cape, Con. Ball, Swgd., \$2.00.....	2¢

Primers	
Berdan Primers, \$1.00.....	2¢
B. L. Cape (for Sturtevant Shells) \$1.00.....	2¢
All other Primers, \$1.20.....	2¢

Shells	
First quality, 4, 8, 10 and 12 gauge.....	20¢
First quality, 14, 16 and 20 gauge (10 list).....	30¢
Star, Club, Rival and Climax brands.....	20¢

Selbold's Comb. Shot Shells.....	15¢
Brass Shot Shells, 1st quality.....	60¢
Brass Shot Shells, Club, Rival, Climax.....	65¢
I X L, 10 and 12 gauge.....	40¢
"Special," 16 gauge.....	30¢
"Special," 10 and 12 gauge.....	40¢
Fowler's Pat.....	\$3.25

Shells Loaded—	
A. M. Co. List No. 10, 1887, see Trade Report.	

Wads—	
U. M. C. & W. R. A.—B. E., 11 up, \$2.00.....	2.30
U. M. C. & W. R. A.—B. E., 9&10.....	2.30
U. M. C. & W. R. A.—B. E., 7&8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up, \$3.10.....	3.10
U. M. C. & W. R. A.—P. E., 9&10.....	4.00
U. M. C. & W. R. A.—P. E., 7&8.....	4.90

Eley's E. B., 11 up.....	\$1.75
Eley's P. E., 11 up.....	2.80

Anvils—	
Eagle Anvils, 7 & 10¢.....	20¢
Peter Wright's.....	20¢
Armstrong's Mouse Hole.....	54¢
Armstrong's Mouse Hole, Extra.....	54¢
Trenton.....	54¢
Wilkinson's.....	54¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢

Anvil Vise and Drill—	
Millers Falls Co., \$18.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise, \$3.00.....	40¢

Apple Parers—	
Advance.....	7¢
Antrim Combination.....	7¢
Baldwin.....	7¢
Champion.....	7¢
Eureka, 1888.....	17¢
Family Bay State.....	12¢
Gem.....	5¢
Gold Medal.....	4¢
Hudson's New.....	4¢
Ideal.....	7¢
Improved Bay State.....	8¢
Little Star.....	4¢
Monarch.....	13¢
New Lightning.....	5¢
Oriole.....	4¢
Penn.....	4¢
Perfection.....	4¢
Pomona.....	4¢

Augers and Bits—	
Douglas Mfg. Co.....	70¢
Wm. A. Ives & Co.....	70¢
Humphreysville Mfg. Co.....	70¢
French, Swift & Co. (F. H. Beecher, Rockford Bit Company).....	65¢
Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co.....	50¢
Ives' Circular Ld.....	30¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension.....	40¢
Up.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set, 32 1/2 quarts, No. 5, 25; No. 30, \$5.50.....	20¢
Lewis' Patent Single Twist.....	25¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢
Pugh's Black.....	20¢
Rockford, Jennings' Pattern.....	60¢
Car Bits.....	50¢
L. Hommedieu Co. Bits.....	15¢
Forstner Pat. Auger Bits.....	10¢
Rocking Table.....	5¢
Turntable.....	4¢
Victor.....	13¢
Waverly.....	4¢
White Mountain.....	4¢
72.....	4¢
76.....	5¢
78.....	5¢

## Hollow Augers—

Ives'.....	25¢
French, Swift & Co.....	25¢
Douglas.....	25¢
Bonney's Adjustable, 1/2 doz \$48.....	40¢
Stearns.....	30¢
Ives' Expansive, each \$4.50.....	50¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢

## Expansive Bits—

Clarks' small, \$18; large, \$25.....	35¢
Ives' No. 4, 1/2 doz \$30.....	40¢
Swan's.....	40¢
Stearns, No. 1, \$26; No. 2, \$22.....	35¢
Stearns' No. 2, \$48.....	20¢

## Gimlet Bits—

Common.....	25¢
Diamond.....	25¢
Bee.....	25¢
Double Cut, Shephardson's.....	45¢
Double Cut, Ct. Valley Mfg. Co.....	30¢
Double Cut, Hartwell's, 1/2 gro.....	25¢
Double Cut, Douglas's.....	40¢
Double Cut, Ives.....	60¢

## Bit Stock Drills—

Morse Twist Drills.....	50¢
Standard.....	50¢
Cleveland.....	50¢
Syracuse, for metal.....	50¢
Syracuse, for wood (wood list).....	30¢
Williams' or Holt's, for metal.....	40¢
Williams' or Holt's, for wood.....	40¢

## Ship Augers and Bits—

L'Hommiedieu's.....	15¢
Watrous.....	15¢
Snell's.....	15¢
Snell's Ship Auger Pat'n Car Bits.....	15¢

## Awl Hafts—

Sewing, Brass Fer, 1/2 gr \$3.50.....	45¢
Pat. Sewing, Short, \$1.00.....	40¢
Pat. Sewing, Long.....	40¢
Pat. Peg, Plain Top, 1/2 gr \$10.00.....	45¢
Pat. Peg, Leather Top, 1/2 gr \$12.00.....	45¢

## Awls, Brad Sets, &c—

Awls, Sewing, Common.....	1/2 gr \$1.70, 35¢
Awls, Should. Peg, 1/2 gr \$2.45, 40¢	40¢
Awls, Pat. Peg, 1/2 gr \$3.....	40¢
Awls, Shouldered Brad, 1/2 gr.....	35¢
Awls, Handled Brad, 1/2 gr.....	45¢
Awls, Handled Scratch, 1/2 gr.....	45¢
Awls, Socket Scratch, 1/2 doz.....	15¢

## Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	55¢
No. 20, 1/2 doz \$10.00.....	55¢
Fraser's Adj. Tool Hds., Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....	25¢
Miller's Falls Adj. Tool Hds.....	25¢
Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.....	25¢
Henry's Combination Haft.....	25¢
Brad Sets.....	25¢
No. 42, \$10.50; No. 43, \$12.50.....	70¢
Stanley's Excelsior.....	50¢
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....	30¢

## Axes—

First quality.....	50¢
Others.....	50¢

## Makers' and Special Brands—

First quality.....	50¢
Others.....	50¢

## Axle Grease—

Fraser's.....	5¢
Fraser's, in boxes.....	5¢
Dixon's Everlasting, in bxs.....	1¢
Dixon's Everlasting, 10-lb pails, ea.....	25¢
Lower grades, special brands.....	5¢

## Axles—

No. 1.....	4¢
Nos. 7 to 14.....	5¢
Nos. 15 to 18.....	47¢
Nos. 19 to 22.....	70¢
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5).....	33¢
Less than 10 sets.....	33¢
Over 10 sets.....	33¢

## Bag Holders—

Sprengle's Pat.....	60¢
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## Balances—

Spring Balances.....	50¢
Common 24-lb.....	15¢
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells—

Hand—	
Light Brass.....	70¢
Extra Heavy.....	60¢
White Metal.....	60¢
Silver Chime.....	33¢
Globe (Cone's Patent).....	25¢

## Door—

Gong, Abbe's.....	33¢
Gong, Yankee.....	45¢
Gong, Barton's.....	40¢
Gong, Taylor's.....	25¢
Crank, Brooks'.....	50¢
Crank, Cone's.....	10¢

Crank, Connel's.....	20¢
Lever, Sargent's.....	60¢
Lever, Taylor's.....	25¢
Lever, Taylor's Janned.....	25¢
Lever, R. E. M. Co.'s.....	50¢
Pull, Brook's.....	50¢
Pull, Western.....	25¢

Common Wrought.....	60¢
Western.....	20¢
Western, Sargent's list.....	70¢
Kentucky, Star.....	20¢
Kentucky, Sargent's list.....	70¢
Dodge, Genuine Kentucky.....	70¢
Texas Star.....	50¢
Call.....	40¢
Farm Bells.....	40¢
Steel Alloy Church and School Bells.....	40¢

## Bellows—

Blacksmiths'.....	50¢
Molders'.....	40¢
Hand Bellows.....	40¢

## Belting, Rubber—

Common Standard.....	70¢
Standard.....	70¢
Extra.....	60¢
N. Y. B. & P. Co., Carbon.....	60¢
N. Y. B. & P. Co., Diamond.....	60¢

## Bench Steps—

Morrill's.....	50¢
Hotchkiss's.....	50¢
Weston's, No. 1, \$10; No. 2, \$25.....	10¢
McGill's.....	10¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.	
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## Bit Holders—

Extension.....	40¢
Barber's.....	40¢
Ives, 1/2 doz \$20.00.....	60¢
Diagonal.....	40¢
Angular.....	40¢

## Blind Adjusters—

Domestic.....	30¢
Excelsior.....	60¢
Washburn's Self-Locking.....	20¢

## Blind Fasteners—

Mackrell's, 1/2 doz, \$1.00.....	20¢
Van Sand's Screw Pat., \$15 1/2 gr.....	60¢
Van Sand's Old Pat., \$15.00 1/2 gr.....	55¢
Washburn's Old Pattern, 1/2 gr.....	90¢
Merrill's.....	90¢
Austin & Eddy No. 2008, 1/2 gr.....	90¢
Security Gravity, 1/2 gr.....	90¢

## Blind Staples—

Barbed, 1/2 in. and larger.....	7¢
Barbed, 1/2 in.....	8¢

## Blocks—

Ordinary Tackle, list May 20, 1889.....	40¢
Cleveland Block Co., Mal. Iron.....	50¢
Moore's Novelty, Mal. Iron.....	50¢

## Bolts—

### Door and Shutter—

Cast Iron Barrel, Square, &c.....	70¢
Cast Iron Shutter Bolt.....	70¢
Cast Iron Chain (Sargent's list).....	65¢
Ives' Patent Door Bolts.....	60¢
Wrought Barrel.....	70¢
Wrought Square.....	70¢
Wrt Shutter, Iron, Stanley's.....	60¢
Wrt Shutter, Brass Knob.....	60¢
Wrt Shutter, Sargent's list.....	60¢
Wrt Sunk Flush, Sargent's list.....	55¢
Wrt Sunk Flush, Stanley's list.....	50¢
Wrt B.K. Flush, Com'n.....	55¢

### Carriage, Machine, &c.—

Com. list June 10, '84.....	75¢
Genuine Eagle, list Oct., '84.....	75¢
Phila. pattern, list Oct. 7, '84.....	75¢
R.B. & W., old list.....	70¢
Machine, according to size.....	75¢
Bolt Ends, according to size.....	75¢

### Fire—

Common, list Feb. 28, '83.....	70¢
Port Chester Bolt and Nut Company.....	70¢
Empire, list Feb. 28, '83.....	70¢
Phila., list Oct. '84.....	82¢
Keystone, Philadel., list Oct. '84.....	80¢
Norway, Phila., list Oct. '84.....	75¢
American Screw Company.....	75¢
Norway, Phila., list Oct. 16, '84.....	80¢
Eagle, Phila., list Oct. 16, '84.....	82¢
Phila., list Oct. 16, '84.....	82¢
Bay State, list Feb. 28, '83.....	70¢
R.B. & W., Philadel., list Oct. 16, '84.....	82¢

### Stove and Plow—

Stove.....	85¢
Plow.....	60¢
R. B. & W., Plow.....	55¢

## Borax—

### Boring Machines—

Without Augers.....	50¢
Douglas.....	50¢
Snell's, Rice's Pat. 5.50.....	67¢
Jennings.....	67¢
Other Machines.....	2.35
Phillips' patent with Augers.....	7.50

<b>Cards—</b>	
Horse & Curry.....	10¢10¢10¢10¢
Cotton.....	10¢10¢10¢
Wool.....	10¢10¢10¢
<b>Carpet Stretchers—</b>	
Cast Steel, Polished.....	50¢ doz \$2.25
Cast Iron, Steel Points.....	50¢ doz \$2.00
Socket.....	50¢ doz \$1.75
Bullard's.....	25¢ doz \$1.00
<b>Carpet Sweepers—</b>	
Bissell No. 5.....	50¢ doz \$17.00
Bissell No. 7 New Drop Pan.....	50¢ doz \$19.00
Bissell, Grand.....	50¢ doz \$26.00
Grand Rapids.....	50¢ doz \$24.00
Crown Jewel, No. 1.....	\$19.00; No. 2, \$20.00
Magie.....	50¢ doz \$15.00
Jewel.....	50¢ doz \$17.00
Improved Parlor Queen.....	50¢ doz \$27.00
Nickel.....	50¢ doz \$24.00
Japanese.....	50¢ doz \$24.00
Excelsior.....	50¢ doz \$18.00
Garland.....	50¢ doz \$18.00
Parlor Queen.....	50¢ doz \$24.00
Housewife's Delight.....	50¢ doz \$15.00
Queen.....	50¢ doz \$15.00
Queen, with band.....	50¢ doz \$18.00
King.....	50¢ doz \$20.00
Wool, Improved.....	50¢ doz \$18.00
Hub.....	50¢ doz \$18.00
Cog-Wheel.....	50¢ doz \$18.00
Conqueror.....	50¢ doz \$22.00
Easy.....	50¢ doz \$22.00
Monarch.....	50¢ doz \$22.00
Goshen.....	50¢ doz \$21.00
Advance.....	50¢ doz \$18.00
Ladies' Friend, No. 1.....	50¢ doz \$18.00
No. 2.....	50¢ doz \$18.00
American.....	50¢ doz \$15.00
Grand Republic.....	50¢ doz \$35.00
<b>Cartridges—</b>	
See Ammunition.	
<b>Casters—</b>	
Bed.....	Brass.....55¢55¢25¢
Plate.....	Others.....60¢60¢25¢
Shallow Socket.....	40¢10¢
Deep Socket.....	40¢10¢
Yale Casters, list May, 1888.....	30¢10¢40¢
Yale, Gem.....	45¢10¢50¢
Martin's Patent (Phoenix).....	45¢10¢50¢
Payson's Anti-friction.....	60¢60¢10¢
Giant Truck Casters.....	50¢10¢
Stationary Truck Casters.....	50¢10¢
Socket Truck Casters.....	50¢
<b>Cattle Leaders—</b>	
Humason, Beckley & Co.'s.....	70¢
Sargent's.....	65¢40¢10¢
Hofekiss.....	30¢
Peck, Stow & W. Co.....	50¢10¢
<b>Chain—</b>	
Trace, 5-10-2, exact.....	50¢10¢50¢10¢25¢
Trace, 5-10-3, exact.....	50¢10¢50¢10¢25¢
Trace, 5-10-4, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-2, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-3, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-4, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-5, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-6, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-7, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-8, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-9, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-10, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-11, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-12, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-13, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-14, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-15, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-16, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-17, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-18, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-19, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-20, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-21, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-22, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-23, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-24, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-25, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-26, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-27, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-28, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-29, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-30, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-31, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-32, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-33, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-34, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-35, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-36, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-37, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-38, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-39, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-40, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-41, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-42, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-43, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-44, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-45, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-46, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-47, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-48, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-49, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-50, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-51, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-52, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-53, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-54, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-55, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-56, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-57, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-58, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-59, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-60, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-61, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-62, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-63, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-64, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-65, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-66, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-67, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-68, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-69, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-70, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-71, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-72, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-73, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-74, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-75, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-76, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-77, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-78, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-79, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-80, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-81, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-82, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-83, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-84, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-85, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-86, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-87, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-88, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-89, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-90, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-91, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-92, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-93, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-94, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-95, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-96, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-97, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-98, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-99, exact.....	50¢10¢50¢10¢25¢
Trace, 7-10-100, exact.....	50¢10¢50¢10¢25¢
<b>Chalk Lines—</b>	
See Lines.	
<b>Chisels—</b>	
Socket Framing and Firmer.	
P. S. & W.....	75¢5¢75¢10¢
New Haven.....	75¢5¢75¢10¢
Wetherby.....	75¢5¢75¢10¢
Mix.....	75¢5¢75¢10¢
Ohio Tool Co.....	75¢5¢75¢10¢
Douglas.....	75¢5¢75¢10¢
Buck Bros.....	75¢5¢75¢10¢
Merrill.....	75¢5¢75¢10¢
L. & I. J. White.....	75¢5¢75¢10¢
<b>Tanged and Miscellaneous.</b>	
Tanged Firmers.....	40¢10¢50¢
Butcher's.....	40¢10¢50¢
Spear & Jackson's.....	40¢10¢50¢
Buck Bros.....	40¢10¢50¢
Cold Chisels.....	40¢10¢50¢
<b>Chucks—</b>	
Beach Pat.....	each \$8.00, 30¢
Morse's Adjustable, each.....	\$7.00, 20¢20¢5¢
Danbury.....	each \$8.00, 30¢30¢5¢
Syracuse, Bait Pat.....	30¢
Skinner's Pat. Drill Chucks.....	30¢
Skinner's Independent Lathe Chucks.....	40¢
Skinner's Pat. Comb. Chuck.....	40¢
<b>Clamps—</b>	
R. I. Tool Co.'s Wrought Iron.....	25¢
Adjustable, Gray's.....	30¢
Adjustable, Lambert's.....	30¢
Adjustable, Snow's.....	40¢5¢
Adjustable, Hammers.....	15¢
Adjustable, Stearn's.....	20¢10¢
Stearn's Adjustable Cabinet and Cor.....	30¢10¢
Cabinet, Sargent's.....	60¢10¢
Carriage Makers' Sargent's.....	70¢10¢
Eberhard Mfg. Co.....	40¢5¢40¢10¢
Warner's.....	40¢10¢40¢10¢5¢
<b>Clips—</b>	
See Vises	
Norway Axle, 1/4 & 5-16.....	55¢5¢5¢
2nd grade Norway Axle, 1/4 & 5-16.....	35¢5¢5¢
Superior Axle Clips.....	40¢5¢40¢5¢5¢
Norway Spring Bar Clips, 5-16.....	80¢5¢5¢
Wrought-iron Felloe Clips.....	5¢
Steel Felloe Clips.....	5¢
Baker Axle Clips.....	25¢
<b>Cockeyes.....</b>	
50¢	
<b>Cocks, Brass.....</b>	
40¢10¢25¢	
<b>Hardware list.....</b>	
40¢10¢25¢	
<b>Coffee Mills—</b>	
Box and Side, list Jan. 1, 1888.....	50¢25¢
American, Enterprise Mfg Co.....	50¢10¢30¢
The Swift, Lane Bros.....	50¢10¢
<b>Compasses Dividers, &amp;c—</b>	
Compasses, Callipers, Dividers.....	70¢70¢10¢
Bemis & Call Co's.....	60¢25¢
Dividers.....	60¢25¢
Compasses & Callipers.....	60¢25¢
Wing and Inside or Outside.....	60¢25¢
Double.....	60¢25¢
(Call's Pat. Inside).....	60¢25¢
Excelsior.....	60¢25¢
J. Stevens & Co.'s.....	35¢10¢
Starrett's.....	25¢10¢
Spring Callipers and Dividers.....	25¢10¢10¢
Lock Callipers and Dividers.....	25¢10¢
Combination Dividers.....	25¢10¢
<b>Coppers' Tools—</b>	
Bradley's.....	30¢
Barton's.....	30¢20¢5¢
L. & I. J. White.....	30¢25¢
Albertson Mfg. Co.....	35¢
Beatty's.....	30¢
Sandusky Tool Co.....	30¢30¢5¢
<b>Corkscrews—</b>	
Humason & Beckley Mfg. Co.....	40¢40¢10¢
Clough's Pat.....	35¢40¢35¢25¢
Howe Bros & Hulbert.....	35¢
<b>Cork Knives and Cutters—</b>	
Bradley's.....	10¢
Wadsworth's.....	25¢
<b>Cradles—</b>	
Grain.....	50¢25¢
<b>Cravens.</b>	
White Crayons.....	5¢ gr 12¢12¢4¢
D. M. Stewart Mfg. Co., Metal Work.....	25¢
gr. \$2.50.....	25¢
D. M. Stewart Mfg. Co., Rolling Mill.....	25¢
gr. \$2.50.....	25¢
<b>Crew Bars—</b>	
Cast Steel.....	50¢4¢
Iron, Steel Points.....	50¢3¢4¢
<b>Curry Combs—</b>	
Fitch's.....	50¢10¢50¢10¢10¢
Rubberer doz.....	\$10.00, 20¢
Perfect.....	50¢
<b>Curtain Pins—</b>	
Silvered Glass.....	net
White Enamel.....	net
<b>Cutlery—</b>	
Beaver Falls & Booth's.....	35¢
Wostenholme.....	\$7.75 to 2
<b>Dampers, &amp;c—</b>	
Dampers, Buffalo.....	40¢10¢
Buffalo Damper Clips.....	40¢10¢
Crown Damper.....	40¢
Excelsior.....	40¢10¢
<b>Dividers—</b>	
See Compasses.	
<b>Dog Collars—</b>	
Embossed, Gilt, Pope & Steven's list.....	30¢10¢
Leather, Pope & Steven's list.....	40¢
Brass, Pope & Steven's list.....	40¢
<b>Door Springs—</b>	
Torrey's Rod, regular size.....	50¢ doz \$1.30
Gray & S. gr.....	\$20.00, 30¢
See Rod.....	\$30.00, 30¢
Warner's No. 1.....	50¢ doz \$2.50; No. 2, \$3.00, 40¢10¢50¢
Gem (Coll), list April 19, 1888.....	10¢
Star (Coll), list April 19, 1888.....	20¢
Victor (Coll).....	60¢60¢10¢
Champion (Coll).....	60¢10¢50¢10¢10¢
Philadelphia, 5 in., \$6.00; 8 in., \$7.75.....	5¢
Cowell's.....	No. 1, 50¢ doz \$18.00; No. 2, \$15.00, 50¢
Rubber, complete.....	50¢ doz \$4.50, 55¢10¢
Hercules.....	50¢
Shaw Door Check and Spring.....	25¢30¢35¢
<b>Drawing Knives—</b>	
Wetherby.....	75¢5¢
P. S. & W.....	75¢10¢
New Haven.....	75¢10¢
Merrill.....	60¢10¢60¢10¢25¢
Douglas.....	75¢75¢25¢
Watrous.....	15¢10¢25¢
L. & I. J. White.....	20¢5¢
Bradley's.....	35¢
Adjustable Handle.....	25¢35¢4¢
Wilkinson's Folding.....	25¢25¢5¢
<b>Drills and Drill Stocks—</b>	
Blacksmiths.....	each \$1.75
Blacksmiths' Self-Feeding, each.....	\$7.50, 20¢
Breast, P. S. & W.....	40¢10¢
Breast, Wilson's.....	30¢25¢
Breast, Millers Falls.....	each \$3.00, 25¢
Breast, Bartholomew's.....	each \$2.50, 25¢10¢40¢
Ratchet, Merrill's.....	30¢20¢5¢
Ratchet, Ingersoll's.....	25¢
Ratchet, Parker's.....	30¢20¢5¢
Ratchet, Whitney's.....	20¢10¢
Ratchet, Weston's.....	20¢25¢
Ratchet, Moore's Triple Action.....	25¢30¢
Whitney's Hand Drill, Plain.....	\$11.00, 30¢
Adjustable.....	\$12.00, 20¢10¢
Wilson's Drill Stocks.....	10¢
Automatic Boring Tools.....	\$1.75¢1.85
<b>Twist Drills—</b>	
Morse.....	50¢10¢25¢
Standard.....	50¢10¢25¢
Syracuse.....	50¢10¢
Cleveland.....	50¢10¢25¢
Williams.....	50¢10¢10¢
New Process.....	50¢10¢25¢
<b>Drill Bits—</b>	
See Augers and Bits.	
<b>Drill Chucks—</b>	
See Chucks.	
<b>Dripping Pans—</b>	
Small sizes.....	5¢ doz \$2.00
Large sizes.....	5¢ doz \$2.00
<b>Egg Beaters.</b>	
Dover.....	50¢ doz \$1.50
National.....	50¢ doz \$4.50
Family (T. & S. Mfg. Co.).....	50¢ doz \$17.00
Duplex (Standard Co.).....	50¢ doz \$18.00
Rival (Standard Co.).....	50¢ doz \$12.00
Large Duplex (Standard Co.).....	50¢ doz \$4.50
Triumph (T. & S. Mfg. Co.).....	50¢ doz \$10.50
Advance, No. 1.....	50¢ doz \$10.50
Advance, No. 2.....	50¢ doz \$10.00
Bryant's.....	50¢ doz \$15.00
Ayres' Spiral.....	50¢ doz \$5.00
Double (H. & R. Mfg. Co.).....	50¢ doz \$15.30
Easy (H. & R. Mfg. Co.).....	50¢ doz \$14.00
Triple (H. & R. Mfg. Co.).....	50¢ doz \$16.30

Cross-Cut Saw Handles—  
 Atkins' No. 1 Loop, pair, 80¢; No. 3,  
 22¢; No. 2 and No. 4 Reversible, 22¢.  
 Boynton's Loop Saw Handles, 50¢... 15¢  
 Champion... 80¢

## Hangers—

Barn Door, old patterns... 60¢10¢10¢70¢  
 Barn Door, New England, 60¢10¢10¢70¢  
 Samson Steel Anti-Friction... 55¢  
 Orleans Steel... 55¢  
 Hamilton Wrought Wood Track... 55¢  
 U. S. Wood Track... 55¢  
 Champion... 60¢10¢  
 Rider and Wooster, Medina Yfg. Co.'s  
 list... 70¢  
 Climax Anti-Friction... 70¢  
 Climax Anti-Friction for Wood Track... 55¢  
 Zenith for Wood Track... 55¢  
 ed's Steel Arm... 50¢  
 allenge, Barn Door... 50¢  
 Sterling's Imp'ed (Anti-Friction)... 55¢10¢  
 Victor, No. 1, \$15.00; No. 2, \$16.50; No.  
 3, \$18.00... 50¢25¢  
 Cheritree... 50¢10¢60¢  
 Kidder's... 50¢10¢60¢  
 The Boss... 60¢10¢  
 Best Anti-Friction... 60¢10¢  
 Duplex (Wood Track)... 60¢10¢25¢  
 Terry's Pat., 7 dos pr. 4' 2, \$10.00; 5 in.  
 \$11.00... 50¢25¢50¢  
 Cronk's Pat. No. 4, \$12.00; No. 5, \$14.00;  
 No. 6, \$15.00... 50¢15¢60¢  
 Wood Track Iron Clad, 7 ft. 10¢... 50¢  
 Carrier Steel Anti-Friction... 50¢25¢25¢  
 Architect, 7 set \$6.00... 20¢10¢  
 Eclipse... 20¢  
 Felix, 7 set \$4.50... 20¢  
 Richards... 30¢30¢10¢  
 Lane's Steel Anti-Friction... 50¢  
 Ball Bearing Door Hanger, 20¢10¢25¢10¢  
 Warner's Pat... 20¢30¢10¢  
 Stearns' Anti-Friction... 25¢10¢25¢10¢10¢  
 Stearns' Challenge... 40¢40¢25¢  
 Faultless... 20¢10¢  
 American, 7 set \$6.00... 20¢10¢  
 Rider & Wooster, No. 1, 62¢; No. 2,  
 75¢... 40¢  
 Paragon, Nos. 1, 2 and 3... 40¢10¢  
 Paragon, Nos. 5, 6, 7 and 8... 50¢10¢  
 Crescent... 60¢60¢10¢  
 Nickel Cast Iron... 60¢  
 Nickel Malleable Iron and Steel... 40¢  
 Seranton Anti-Friction Single Strap... 38¢4¢  
 Seranton Anti-Friction Double Strap... 40¢  
 Universal Anti-Friction... 40¢  
 Wild West 4 in. Wheel, \$15.00; 5 in.  
 Wheel, \$21.00... 45¢  
 Star... 40¢10¢40¢10¢25¢  
 May... 50¢25¢50¢10¢  
 Barry, \$6.00... 40¢10¢

## Harness Snaps—

## See Snaps.

## Hatchets—

List Jan. 1, 1888... 35¢40¢  
 Isaiah Blood... 40¢45¢  
 Hunt's Shingling, Lath and Claw... 40¢45¢  
 Hunt's Broad... 40¢  
 Buffalo Hammer Co... 40¢10¢50¢  
 Hurd's... 40¢10¢50¢  
 Fayette R. Plumb... 40¢10¢50¢  
 Wm. Mann, Jr. & Co... 50¢50¢25¢  
 Underhill Edge Tool Co... 40¢10¢50¢  
 Underhill's, Haines and Bright... 35¢4¢  
 C. Hammond & Son... 40¢10¢50¢  
 Simmons... 40¢10¢40¢10¢25¢  
 Peck's... 40¢10¢40¢10¢25¢  
 Kelly's... 50¢50¢25¢  
 Sargent & Co... 50¢  
 Ten Eyck Edge Tool Co... 40¢10¢40¢10¢25¢  
 Collins... 10¢  
 Schulte, Loboff & Co... 50¢50¢25¢

## Hay and Straw Knives—

Lightning, Mfrs. price 7 dos \$18.00, 25¢  
 But jobbers frequently give extras.  
 Gem... 7 dos \$10  
 Wadsworth's... 40¢7¢40¢10¢  
 Carter's Needle... 7 dos \$11.00; 12 in.  
 Heath's... 7 dos \$13.50; 14 in.  
 Auburn Hay, Com. and Straw Point... 50¢  
 Auburn, Straw... 40¢  
 Nolin's Hay... 7 dos \$10.00

## Hinges—

Wrought Iron Hinges  
 Strap and T... 75¢5¢75¢10¢  
 Screw Hook and... 6 to 12 in., 7 dos... 24¢  
 Strap... 14 to 20 in., 7 dos... 24¢  
 22 to 30 in., 7 dos... 24¢  
 Heavy Welded... 14 to 20 in., 7 dos... 24¢  
 Hook... 22 to 30 in., 7 dos... 24¢  
 Screw Hook... 14 in., 7 dos \$1.50  
 and Eye... 14 in., 7 dos \$2.45; 10¢  
 Rolled Blind Hinges, Nos. 32 and 34... 50¢10¢  
 Rolled Blind Hinges, Nos. 232 and 234... 55¢10¢  
 Rolled Plate... 70¢10¢  
 Rolled Raised... 70¢10¢  
 Plate Hinges 8, 10 and 12 in., 7 dos... 45¢  
 "Providence" over 12 in., 7 dos... 45¢  
 Spring Hinges  
 Geer's Spring and Blank Butts... 40¢  
 Union Spring Hinge Co.'s list, March,  
 1888... 30¢  
 Acme and U. S... 30¢  
 Empire and Crown... 20¢  
 Hero and Monarch... 50¢  
 American, Gem, and Star... 50¢  
 American, Gem, and Star, Bronzed... net  
 Oxford, Bronze and Brass... net  
 Barker's Double Acting... 20¢10¢  
 Union Mfg. Co... 25¢  
 Bommer's... 30¢  
 Buckman's... 15¢20¢  
 Chicago... 30¢  
 Wiles... 10¢  
 Devore's... 40¢  
 Rex... 40¢  
 Royal... 60¢  
 Reliable... 60¢  
 Champion... 60¢

## Gate Hinges—

Western... 7 dos \$4.40, 60¢  
 N. E... 7 dos \$7.00, 55¢  
 N. E. Reversible... 7 dos \$5.20, 55¢10¢  
 Clark's, Nos. 1, 2, 3... 60¢10¢25¢  
 N. Y. State... 7 dos \$5.00, 55¢10¢  
 Automatic... 7 dos \$12.50, 50¢  
 Common Sense... 7 dos pair \$4.50, 50¢  
 Seymour's... 45¢10¢  
 Shepard's... 60¢10¢25¢  
 Reed's Latch and Hinges... 7 dos \$12.00,  
 50¢

## Blind Hinges—

Parker... 75¢25¢  
 Palmer... 50¢55¢10¢  
 Seymour... 70¢25¢  
 Nichol... 45¢10¢  
 Hutter... 50¢

Clark's, Nos. 1, 3, 5, 40 and 50... 75¢10¢25¢30¢

Clark's Mortise Gravity... 50¢

Sargent's, Nos. 1, 3, 5, 11, 18... 75¢10¢55¢10¢55¢

Sargent's Gravity... 75¢10¢75¢10¢55¢

Shepard's... 75¢10¢25¢

Noiseless... 75¢10¢25¢

Niagara... 80¢25¢

Buffalo... 80¢25¢

Clark's Genuine Pat... 80¢25¢

O. S. Lull & Porter... 75¢10¢80¢

Acme, Lull & Porter... 75¢25¢

Queen City Reversible... 75¢

Clark's Lull & Porter, Nos. 0, 1, 1 1/2,  
 2 1/2, 3... 75¢10¢25¢

North's Automatic Blind Fixtures, No.  
 2 for Wood, \$10.50; No. 3, for Brick,  
 \$13.50... 25¢25¢

## Hoes—

## Handled—

Garden, Mortar, &c... 65¢  
 Planter's, Cotton, &c... 65¢  
 Warren Hoe... 60¢  
 Magic... 7 dos \$4.00

## Eye—

D. & H. Scovill... 20¢  
 Lane's Crescent Planters Pattern... 45¢25¢  
 Lane's Razor Blade, Scovill Pattern... 30¢  
 Maynard, S. & O. Pat... 45¢25¢  
 Sandusky Tool Co., S. & O. Pat... 60¢  
 Hubbard & Co., S. & O. Pat... 60¢  
 Chattanooga Tool Co., S. & O. Pat... 60¢  
 Grub... 50¢60¢10¢

## Hog Rings and Rings—

Hill's Improved Rings... 7 dos \$4.25

Hill's Old Style Rings... 7 dos \$2.75

Hill's Tongue... 7 dos \$4.50

Hill's Rings... 7 dos bxs \$1.50; 25¢

Perfect Rings... 7 dos bxs \$1.60; 1.70

Perfect Rings... 7 dos \$1.15; 1.25

Blair's Hog Rings... 7 dos \$2.25; 2.50

Blair's Hog Rings... 7 dos \$2.00; 2.50

Champion Rings, Double... 7 dos \$2.00

Brown's Rings... 7 dos \$2.00

Brown's Rings... 7 dos \$1.25; 1.30

## Hoisting Apparatus—

Moore's Hand Hoist, with Lock... 30¢

Moore's Differential Pulley Block... 40¢

Energy Mfg. Co's... 25¢

## Holders, File and Tool—

Bals Pat... 7 dos \$4.00; 25¢

Nicholson File Holders... 20¢

## Hollow-Ware—

## Iron—

Stove Hollow-Ware—

Ground... 60¢60¢25¢

Unground... 60¢10¢60¢10¢10¢

Boilers and Saucepans... 40¢25¢

Thinned Boilers and Saucepans... 40¢

Gray Enamelled Ware—

Stove... 45¢50¢

Maslin Kettles... 60¢10¢60¢10¢10¢

Boilers and Saucepans... 40¢25¢

Agate and Granite Ware, list Jan. 1,  
 1888... 35¢4¢10¢

Rustless Hollow-Ware... 50¢50¢10¢

Galvanized Tea-Kettles—

Inch... 6 7 8 9

Each... 55¢ 60¢ 65¢ 75¢

Sliver Plated—

4 mo. or 5¢ cash in 30 days.

Reed & Barton... 40¢25¢

Meriden Britannia Co... 40¢25¢

Simpson, Hall, Miller & Co... 40¢25¢

Rogers & Brother... 40¢25¢

Hartford Silver Plate Co... 40¢25¢

William Rogers Mfg. Co... 40¢25¢

## Hooks—

## Cast Iron—

Bird Cage, Sargent's list... 60¢10¢10¢

Bird Cage, Reading... 60¢10¢10¢

Clothes Line, Sargent's list... 60¢10¢10¢

Clothes Line, Reading list... 60¢10¢10¢

Ceiling, Sargent's list... 55¢10¢10¢

Harness, Reading list... 55¢10¢10¢

Coat and Hat, Sargent's list... 55¢10¢10¢

Coat and Hat, Reading... 50¢10¢50¢10¢70¢

## Wrought Iron—

Cotton... 7 dos \$1.25

Cotton Pat. (N. Y. Mallet & Handle W'ks)... 7 dos \$2.25

Tassel and Picture (T. & S. Mfg. Co.)... 50¢

Wrought Staples, Hooks, &c... 50¢

See Wrought Goods.

## Wire—

Wire Coat and Hat, Gem, list April,  
 1888... 45¢

Wire Coat and Hat, Miller, list April,  
 1888... 45¢

Indestructible Coat and Hat... 45¢

Wire Coat and Hat, Standard... 45¢

Belt... 75¢10¢80¢

## Miscellaneous.

Grass No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50

Nolin's Grass... 7 dos \$2.25

Whitmore-Patent... 65¢60¢

Hooks and Eyes—Malleable Iron... 50¢

Hooks and Eyes—Brass... 70¢70¢10¢

Fish Hooks, American... 60¢

Bench Hooks... See Bench Stops.

## Horse Nails—

Nos. 6 7 8 9 10

Ausable... 28¢ 28¢ 25¢ 24¢ 23¢

Clinton, Fin. 24¢ 22¢ 21¢ 20¢ 19¢

Essex... 28¢ 26¢ 25¢ 24¢ 23¢

Lyra... 25¢ 23¢ 22¢ 21¢ 20¢

Snowden... 25¢ 23¢ 22¢ 21¢ 20¢

Putnam... 23¢21¢ 20¢ 19¢ 18¢

Vulcan... 23¢ 21¢ 20¢ 19¢ 18¢

Northwest'n... 25¢ 23¢ 22¢ 21¢ 20¢

Globe... 23¢ 21¢ 20¢ 19¢ 18¢

Boston... 23¢ 21¢ 20¢ 19¢ 18¢

A. C... 25¢10¢33¢25¢

B. K... 25¢10¢33¢25¢

Champlain... 28¢ 6¢ 25¢ 24¢ 23¢

New Haven... 23¢ 24¢ 25¢ 24¢ 23¢

Saranac... 23¢ 21¢ 20¢ 19¢ 18¢

Champion... 23¢ 21¢ 20¢ 19¢ 18¢

Capewell... 23¢ 21¢ 20¢ 19¢ 18¢

Star... 23¢ 21¢ 20¢ 19¢ 18¢

Anchor... 23¢ 21¢ 20¢ 19¢ 18¢

Western... 23¢ 21¢ 20¢ 19¢ 18¢

Empire Bronzed... 14¢ 13¢

Horse Shoes—See Shoes Horse.

## Hose, Rubber—

Competition... 75¢10¢75¢10¢25¢

Standard... 70¢70¢10¢

Extra... 60¢60¢10¢

N. Y. B. & P. Co., Para... 30¢10¢

N. Y. B. & P. Co., Extra... 50¢

N. Y. B. & P. Co., Dundee... 60¢10¢25¢

## Huskies—

Blair's Adjustable... 7 gr \$8.00

Blair's Adjustable Clipper... 7 gr 7.00

## Indurated Fiber-Ware.

Spittoons, No. 2, 7 dos... 36.75

Basins, Ringed, 7 dos, No. 1, \$3.70;  
 No. 2, \$3.10; No. 3... \$2.70

Washbasins, Nested, Nos. 0, 1, 2 and 3 (4  
 pieces), 7 dos, nests... \$16.87

Koelers, Nested, Nos. 1, 2, 3 and 4 (4  
 pieces), 7 dos, nests... \$8.37

Butter Bowls, 15, 17 and 19-inch (3  
 pieces), 7 dos, nests... \$6.75

Liquid Measures, pt., qt., 2 qt. and fun-  
 nel (4 pieces), 7 set... \$3.00

Dry Measures, 1, 2, 4, 8 and 16 qt. (6  
 pieces), 7 set... \$2.25

See also Fats.

## Jack Screws—See Screws.

## Kettles—

Spun, Stamped.

Braze, 7 to 17 in., 7 dos... 24¢ 21¢

Brass larger than 17 in., 26¢ 23¢

Enamelled and Tea Kettles.

## Keys—

Lock Ass'n list Dec. 30, 1888... 50¢10¢

Eagle, Cabinet, &c... 35¢25¢

Hotchkiss' Brass Blanks... 40¢

Hotchkiss' Copper and Tinned... 40¢

Hotchkiss' Pad and Cab... 35¢

Ratchet Bed Keys... 7 dos \$4.00, 15¢

Wollensak Tinned... 50¢10¢

## Knife Sharpeners—

Parkin's.

Applewood Handles... 7 dos \$6.00, 40¢

Rosewood or Cocobolo... 7 dos \$6.00, 40¢

## Knives—

Wilson's Butcher Knives... 25¢30¢

Ames' Butcher Knives... 25¢

Foster Bros' Butcher, &c... 40¢

Nichols' Butcher Knives... 40¢10¢

Ames' Shoe Knives... 20¢25¢

Ames' Bread Knives... 7 dos \$1.50, 15¢20¢

Moran's Shoe and Bread... 20¢

Hay and Straw... See Hay Knives.

Table and Pocket... See Cutlery.

Corn, Auburn Mfg. Co. Western Pat... 35.00

Corn, Auburn Mfg. Co. Crescent... \$3.50

## Knobs—

Door Mineral... 65¢68¢

Door Por. Jap'd... 75¢78¢

Door Por. Nickel... \$2.00; 2.25

Door Por. Plated, Nickel... \$2.00; 2.25

Drawer, Porcelain... 60¢10¢60¢10¢10¢

Hammer, Porcelain... 40¢10¢50¢

**Melasses Gates—**

Stebbin's Pat.	70¢@70¢7½¢
Stebbin's Genuine	60¢@10¢10¢
Stebbin's Tinned Ends	40¢10¢
Chase's Hard Metal	50¢10¢
Brush's	20¢
Lincoln's Pattern	70¢@70¢10¢
Wood's	20¢10¢
Boss, # doz:	
No. 1, 77; No. 2, 88; No. 3, 89; No. 4,	60¢@10¢10¢
10.	60¢@10¢10¢

**Money Drawers—** # doz, \$18.00

**Muzzles—** # doz, \$3.00, 25¢

**Nails, see Trade Report.**

Wire Nails & Brads, list July 14, '87

Wire Nails, Standard Penny, # doz, \$2.50

**Nail Puller—**

Curtis Hammer, # doz, \$9.00

Giant, No. 1, # doz, \$30.00, 10¢

Pelican, # doz, \$9.00, 25¢

Boss, # doz, \$30.00, 30¢

Lightning, # doz, \$21.00

**Nail Sets—**

Square, # gr., \$4.00@4.25

Round, # gr., \$3.25

Cannon's Diamond Point, # gr., \$12.20

**Nut Crackers—**

Table (H. & B. Mfg. Co.), # doz, \$4.00

Blake's Pattern, # doz, \$2.00, 10¢

Turner & Seymour Mfg. Co., # doz, 60¢

**Nuts—**

Nuts, of list Jan. 1, 1888: Square, Hex.

Hot Pressed, # doz, 5.4¢ 5.9¢

Cold Punched, # doz, 5.4¢ 5.6¢

In lots less than 100 lb., # lb., add ¼¢; 1-lb.

boxes, add 1¢ to list.

**Oakum—**

Government, # lb, 7¼¢ @ 8¢

U. S. Navy, # lb, 6¼¢ @ 7¢

Navy, # lb, 5¼¢ @ 6¼¢

**Oilers—**

Zinc and Tin, # doz, 65¢@65¢10¢

Brass and Copper, # doz, 50¢@10¢50¢10¢5¢

Malleable, Hammers' Improved, No. 1,

\$3.60; No. 2, \$4.00; No. 3, \$4.40 # doz.

10¢@10¢10¢

Malleable, Hammers, Old Pattern, same

list

Prior's Pat. or "Paragon" Zinc,

60¢@10¢10¢

Prior's Pat. or "Paragon" Brass, 50¢

Olmstead's Tin and Zinc, 60¢

Olmstead's Brass and Copper, 50¢

Broughton's Zinc, 60¢

Broughton's Brass, 50¢

**Packing, Steam—**

Rubber—

Standard, # doz, 60¢@10¢60¢10¢10¢

Extra, # doz, 50¢@10¢60¢

N. Y. B. & P. Co., Standard, # doz, 70¢

N. Y. B. & P. Co., Empire, # doz, 70¢

N. Y. B. & P. Co., Salamander, # doz, 70¢

Jenkins' Standard, # doz, 80¢, 35¢

**Miscellaneous—**

American Packing, # doz, 10¢@11¢

Russia Packing, # doz, 14¢

Italian Packing, # doz, 13¢@14¢

Cotton Packing, # doz, 15¢@17¢

Jute, # doz, 7¢@8¢

**Padlocks—**

See Locks.

**Pails—**

Galvanized Iron—

Quarts, 10 12 14

Hill's Light Weight, # doz, \$2.75 3.00 3.25

Hill's Heavy Weight, # doz, 3.00 3.25 3.75

Whitling's, # doz, 2.75 3.00 3.25

Sidney Shepherd & Co., # doz, 2.80 3.00 3.40

Iron Clad, # doz, 2.75 3.00 3.25

Fire Buckets, # doz, 2.75 3.25 3.50

Buckets, see Well Buckets.

**Indurated Fibre Ware—**

Star Pails, 12 qt., # doz, \$4.50

Fire, Stable and Milk, 14 qt., # doz, \$5.85

**Standard Fibre Ware—**

Per Dozen, Plain, Dec'd

Water Pails, 12 qt., # doz, \$4.00

Dairy Pails, 14 qt., # doz, 4.50 5.00

Fire Pails, No. 1, 12 qt., # doz, 5.00

Fire Pails, No. 2, 14 qt., # doz, 4.50

**Pencils—**

Faber's Carpenters', # high list 50¢

Faber's Round Gilt, # doz, \$5.25

Dixon's Lead, # doz, \$4.50

Dixon's Lumber, # doz, \$6.75

Dixon's Carpenters', # doz, 40¢@10¢

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;

6 to 7, \$13.00, .00¢

**Picture Nails—**

Brass Head, Sargent's list, # doz, 50¢@10¢10¢

Brass Head, Combination list, # doz, 50¢@10¢10¢

Porcelain Head, Sargent's list, # doz, 50¢@10¢10¢

Porcelain Head, Combination list, # doz, 50¢@10¢10¢

Niles' Patent, # doz, 40¢

**Pinking Irons—** # doz 65¢ net

**Pipe, Wrought Iron—**

List March 23, 1887

1½ and under, Plain, # doz, 52¢

1½ and under, Galvanized, # doz, 45¢

1½ and over, Plain, # doz, 65¢

1½ and over, Galvanized, # doz, 52¢

Boiler Tubes, Iron,

1½ and under, # doz, 57½¢

2 in. to 2½ in., # doz, 62½¢

3 in. and larger, # doz, 65¢

**Planes and Plane Irons—**

**Wood Planes—**

Molding, # doz, 50¢@50¢10¢

Bench, First Quality, # doz, 60¢@60¢5¢

Bench, Second Quality, # doz, 60¢@60¢10¢

Bailey's (Stanley R. & L. Co.), # doz, 40¢@10¢

**Iron Planes—**

Bailey's (Stanley R. & L. Co.), # doz, 40¢@10¢

Miscellaneous Planes (Stanley R. & L. Co.), # doz, 20¢@10¢

Victor Planes (Stanley R. & L. Co.), # doz, 20¢@10¢

Steer's Iron Planes, # doz, 35¢@35¢5¢

Meriden Mill Iron Co., # doz, 30¢@10¢30¢10¢10¢

Davis's Iron Planes, # doz, 30¢@10¢30¢10¢10¢

Birmingham Plane Co., # doz, 50¢@50¢5¢

Gage Tool Co.'s Self-Setting, # doz, 20¢@10¢

Chaplin's Iron Planes, # doz, 40¢@40¢5¢

Sargent's, # doz, 30¢@10¢30¢10¢10¢

**Plane Irons—**

Plane Irons, Butcher's, # doz, \$5.00@5.25 to 2

Plane Irons, Buck Bros, # doz, 30¢

Plane Irons, Auburn Tool Co., "This-

tle" # doz, 40¢

Sandusky Tool Co., # doz, 40¢

Single and Cut, # doz, 30¢

Double, # doz, 40¢

L. & I. J. White, # doz, 25¢

**Pliers and Nippers—**

Button's Patent, # doz, 30¢@10¢40¢

Hall's No. 2, 5 in., # doz, \$13.50; No. 4, 7 in.,

\$21.00 # doz, 20¢@10¢30¢4¢

Humason & Beckley Mfg. Co., # doz, 50¢@50¢10¢

Gas Pliers, # doz, 60¢

Eureka Pliers and Nippers, # doz, 50¢5¢

Russell's Parallel, # doz, 25¢

P. S. & W. Cast Steel, # doz, 50¢

P. S. & W. Tinnars' Cutting Nippers, # doz, 50¢

Carew's Pat. Wire Cutters, # doz, 20¢

Morrill's Parallel, # doz, \$12.00, 30¢5¢

Cronk's 8 in., # doz, \$15.00; 10 in., \$21.00,

40¢@40¢5¢

**Plumbs and Levels—**

Regular List, # doz, 70¢@10¢70¢10¢10¢

Diaton's, # doz, 45¢10¢

Pocket Levels, # doz, 70¢@10¢70¢10¢10¢

Davis Iron Levels, # doz, 80¢

Davis' Inclinoimeters, # doz, 10¢@10¢

**Polish, Metal.**

Prestoline, # doz, 20¢@10¢

Krestoline Paste, # doz, 35¢4¢

Gaston's Silver Compound, # doz, 35¢4¢

**Pokes, Animal—**

Bishop's I. X. L., # doz, \$6.50

Bishop's O. K., # doz, \$5.50

Bishop's Pioneer, # doz, \$3.75

Bishop's American, # doz, \$3.00

**Peppers, Corn—**

Round or Square, 1 qt., # gr, \$12.00@15.00

Round or Square, 2 qt., # gr, \$25.00@26.00

**Post Hole and Tree Augers**

**and Diggers—**

Samson Post Hole Digger, # doz, \$36.00,

25¢10¢

Fletcher Post Hole Augers, # doz, \$36.00,

25¢10¢

Eureka Diggers, # doz, \$16.00@17.00

Leed's, # doz, \$8.00@9.00

Vaughan's Post Hole Auger, # doz,

\$13.00@14.00

Kohler's Little Giant, # doz, \$18.00

Kohler's Hercules, # doz, \$15.00

Kohler's New Champion, # doz, \$15.00

Schneider, # doz, \$18.00

Ryan's Post Hole Diggers, # doz, \$24.00

Cronk's Post Bars, # doz, \$60.00,

50¢@50¢10¢

Gibbs Post Hole Digger, # doz, \$30.00, 50¢

Imperial, # doz, \$15.00, 45¢

**Potato Parers—**

White Mountain, # doz, \$5.00@5.50

Antrim Combination, # doz, \$8.00

Hoosier, # doz, \$13.50

**Pruning Hooks and Shears—**

Diaton's Combined Pruning Hook and

Saw, # doz, \$18.00, 20¢10¢

Diaton's Pruning Hook, # doz, \$12.00,

20¢10¢

E. S. Lee & Co.'s Pruning Tools, # doz, 40¢

Pruning Shears, Henry's Pat., # doz, 38.75¢

Henry's Pruning Shears, # doz, \$4.25

Wheeler, M. & C. Co.'s Combination,

# doz, \$12.00, 20¢

Dunlap's Saw and Chisel, # doz, \$8.50, 30¢

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

**Pulleys—**

Hot House, Awning, &c., # doz, 60¢@10¢

Japanned Screw, # doz, 60¢@10¢

Brass Screw, # doz, 60¢@10¢

Japanned Side, # doz, 60¢@10¢

Japanned Clothes Line, # doz, 50¢@60¢

Empire Sash Pulley, # doz, 50¢@60¢

Moore's Sash, Anti-Friction, # doz, 50¢

Hay Fork, Solid Eye, \$4.00; Swivel,

\$4.50, 50¢@10¢50¢10¢5¢

Hay Fork, "Anti-Friction," 5 in. Solid,

\$5.70, 50¢

Hay Fork, "F" Common and Pat.

Bushed, # doz, 20¢

Hay Fork, Tarbox Pat. Iron, # doz, 40¢

Hay Fork, Reed's Self-Lubricating, # doz, 45¢

Shade Rack, # doz, 45¢

Tackle Blocks, # doz, See Blocks

Moore's Anti-Friction 5 in. Wheel, # doz,

\$12.00, 40¢

**Pumps—**

Cistern, Best Makers, # doz, 50¢@10¢60¢

Pitcher Spout, Best Makers, # doz, 60¢@10¢60¢

Pitcher Spout, Cheaper Goods, # doz, 60¢@10¢

70¢@10¢5¢

**Punches—**

Saddlers' or Drive, good, # doz, 60¢@65¢

Bemis & Call Co.'s Cast Steel Drive, 60¢5¢

Bemis & Call Co.'s Spring Steel Socket, 50¢5¢

Spring, good quality, # doz, \$2.50@2.60



<b>Machines—</b>	
Flat Head, Iron.....	55%
Round Head, Iron.....	50%
<b>Bench and Hand—</b>	
Bench, Iron.....	55¢10¢55¢10¢10%
Bench, Wood, Beech.....	50¢22.25
Bench, Wood, Hickory.....	20¢10%
Hand, Wood.....	25¢10¢25¢10¢5%
Lag, Blunt Point.....	75¢75¢10%
Coach and Lag, Gimlet Point.....	75%
Bed.....	55¢10%
Hand Rail, Sargent's.....	65¢10%
Hand Rail, H. & B. Mfg. Co.....	70¢10¢75%
Hand Rail, Am. Screw Co.....	75%
Jack Screws, Millers Falls list.....	50¢50¢5%
Jack Screws, P. S. & W.....	35%
Jack Screws, Sargent.....	60¢10¢60¢10¢5%
Jack Screws, Stearns.....	40¢40¢10%
<b>Scroll Saws—</b>	
Leater, complete, \$10.00.....	25%
Rogers, complete, \$4.00.....	25%
Barnes' Builders' and Cabinet Makers.....	15%
Barnes' Scroll Saw Blades.....	35%
<b>Scythe Snaths.....</b>	50¢2%
<b>Shears—</b>	
American (Cast) Iron.....	75¢10¢75¢10¢5%
Pruning..... See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	50¢37.75
Tinners'.....	30¢2%
Seymour's, List, Dec. 1881.....	30¢10¢10¢10¢5%
Heinrich's, List, Dec. 1881.....	60¢10¢10¢60¢10¢10¢5%
Heinrich's Tailor's Shears.....	35¢1%
First quality C. S. Trimmers.....	80¢80¢10%
Second quality C. S. Trimmers.....	80¢10¢80¢10¢10%
Acme Cast Shears.....	10¢10%
Diamond Cast Shears.....	10%
Clipper.....	10¢10%
Victor Cast Shears.....	75¢10¢75¢10¢5%
Howe Bros. & Hulbert, Solid Forged Steel.....	40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....	80%
Clausen Shear Co., Japaned.....	70%
Clausen Shear Co., Nickel, same list.....	80%
<b>Sheaves—</b>	
<b>Sliding Door—</b>	
M. W. Co., List July, 1888.....	50¢10¢60¢1%
B. & E., List Dec. 18, 1885.....	55¢20%
Corbin's List.....	60¢10¢2%
Patent Roller.....	60¢10¢2%
Patent Roller, Hatfield's.....	75%
Russell's Anti-Friction, List Dec. 1885.....	60¢2%
Moore's Anti-Friction.....	60%
<b>Sliding Shutter—</b>	
R. & E., List Dec. 18, 1885.....	60¢10¢2%
Sargent's List.....	60¢10%
Reading list.....	60¢10¢10%
<b>Ship Tools—</b>	
L. & I. J. White.....	20¢5%
Albertson Mfg. Co.....	25%
<b>Oes, Horse, Mule, &amp;c.—</b>	
<b>Horse—</b>	
Gurden's, Perkins', Phoenix, at factory.....	\$4.00
<b>Mule—</b>	
Add \$1 per keg to above prices.	
<b>Ox, Wrought—</b>	
Ton lots.....	7¢ 9¢
1000 lb lots.....	7¢ 9¢
500 lb lots.....	7¢ 10¢
<b>Shot—</b>	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 bag, 25 lb.....	\$1.16
Drop, 7 bag, 5 lb.....	.20
Buck and Chilled, 7 25-lb bag.....	1.41
Buck and Chilled, 7 5-lb bag.....	.34
<b>Shovels and Spades—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20%
NOTE.—Jobbers frequently give 5¢ 7½¢ extra on above.	
Griffith's Black Iron.....	50¢10%
Griffith's C. S.....	50¢60¢10%
Griffith's Solid C. S. R. R. Goods.....	50%
Old Colony (Sanford Fork & Tool Co.).....	20%
St. Louis Shovel Co.....	20¢20¢7½%
Hussey, Binns & Co.....	15¢5%
Hubbard & Co.....	20¢20¢7½%
Lehigh Mfg. Co.....	50¢10%
Payne Pettibone & Son, list January, 1888.....	30%
Remington's (Lowman's) Pat. 30¢10¢40%	
Rowland's, Black Iron.....	50¢10%
Rowland's Steel.....	60¢5¢60¢10%
<b>Shovels and Tongs—</b>	
Iron Head.....	60¢10¢60¢10¢5%
Brass Head.....	60¢10¢10%
<b>Skins, Thimble—</b>	
Western list.....	75¢5¢75¢10%
Columbus Wrt. Steel, list Nov. 1, 1887.....	20%
Coldbrookdale Iron Co.....	50¢10%
Utica P. S. T. Skins.....	80%
Utica Turned and Fitted.....	35%
<b>Sieves—</b>	
Buffalo Metallic, S. S. & Co.....	50¢25¢10%
Shaker (Barier's Pat.) Flour Sifters.....	70¢22.00
Electric.....	7¢18.00
Hunter's.....	7¢21.00
Smith's Adjustable Sifters.....	70¢22.00
Smith's Adjustable Milk Strainer.....	70¢22.00
Smith's Adjustable T. & C. Strainer.....	70¢22.00
<b>Sieves, Wooden Rim—</b>	
Mesh 18, Nested, 7 doz.....	70¢ 90¢
Mesh 20, Nested, 7 doz.....	85¢ 11.00
Mesh 24, Nested, 7 doz.....	1.00 1.10
<b>Slates—</b>	
School, by case.....	40%
<b>Snaps, Harness, &amp;c.—</b>	
Anchor (T. & S. Mfg. Co.).....	65%
Fitch's (Bristol).....	50¢10%
Hotchkiss.....	10%
Andrews.....	50%
Sargent's Patent Guarded.....	70¢10¢10%
German, new list.....	40¢10%
Covert, New Patent.....	50¢2%
Covert, New R. E.....	60¢2%
Covered Springs.....	60¢10¢10%
<b>Soldering Irons—</b>	
Covert's Adjustable, list Jan. 1, 1888.....	35¢2%

<b>Spoke Shaves—</b>	
Iron.....	45%
Wood.....	30%
Bailley's (Stanley R. & L. Co.).....	40¢10%
Stearns.....	30¢10¢30%
<b>Spoke Trimmers—</b>	
Bonney's.....	70¢10.00, 50%
Stearns.....	80¢10%
Ives, No. 1, \$15.00; No. 2, \$12.00.....	70¢10%
Douglas.....	70¢10.00, 30%
<b>Spoons and Forks—</b>	
<b>Tinned Iron—</b>	
Basting, Cen. Stamp. Co.'s list.....	70¢10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....	70¢10%
Buffalo S. S. & Co.....	35¢12%
<b>Silver-Plated—(4 mos. or 5¢ cash 30 days.)</b>	
Meriden Brit. Co., Rogers.....	50%
C. Rogers & Bros.....	50%
Rogers & Bro.....	50%
Seed & Barton.....	50%
Wm. Rogers Mfg. Co.....	50¢10¢60%
Simpson, Hall, Miller & Co.....	50¢10%
Holmes & Edwards Silver Co.....	50¢10¢60%
L. Boardman & Son.....	50¢10%
<b>Miscellaneous</b>	
Holmes & Edwards Silver Co.....	50¢10%
No. 67 Mexican Silver.....	50¢10%
No. 30 Silver Metal.....	50¢10%
No. 24 German Silver.....	50¢10%
No. 50 Nickel Silver.....	50%
No. 49 Nickel Silver.....	50¢10%
German Silver.....	50¢60¢5
German Silver, Hall & Eikon.....	50¢5¢5¢ cash
Nickel Silver.....	50¢5¢50¢10¢5%
Britannia.....	80%
Boardman's Nickel Silver.....	50%
Boardman's Britannia Spoons, case.....	60%
<b>Springs—</b>	
Elliptic, Concord, Platform and Half Spring.....	60¢60¢5%
Cliff's Bolster Springs.....	25%
<b>Squares—</b>	
Steel and Iron.....	75¢10¢80%
Nickel-Plated.....	60¢10¢60¢10
Try Square and T Bevels.....	60¢10¢60¢10
Dixon's Try Square and T Bevels.....	45¢10%
Winterbottom's Try and Miter.....	30¢10%
Starrett's Micrometer Caliper Squares.....	25%
Avery's Flush Bevel Squares.....	40%
Avery's Bevel Protractor.....	50%
<b>Standard Fibre Ware—</b>	
Wash-Basins, 10½ in.....	\$2.00 \$2.25
Wash-Basins, 12 in.....	2.25 2.75
Keelers, 11¼ in.....	4.00
Cuspidors.....	4.00
Spittoons, "Daisy," 8 in.....	4.00 4.50
Peck Measure.....	4.00
Half-peck Measure.....	3.50
See also Falls.	
<b>Staples—</b>	
Fence Staples, Galvanized.....	Same price as Br'd Wire.
Fence Staples, Plain.....	See Tr'd Rep.
<b>Steelyards.....</b>	40¢10¢50%
<b>Stocks and Dies—</b>	
Blacksmith's.....	30¢5¢30¢10%
Waterford Goods.....	30¢5¢30¢10%
Butterfield's Goods.....	30¢5¢30¢10%
Lightning Screw Plate.....	25¢30%
Reece's New Screw Plates.....	33¢25¢40%
<b>Stone—</b>	
Hindstone No. 1, 3¢; Axe, 3½¢; Slips No. 3, 4¢.....	2¢ 2½¢
Sand Stone.....	7¢ 10¢20%
Washita Stone, Extra.....	7¢ 10¢20%
Washita Stone, No. 1.....	7¢ 14¢15%
Washita Stone, No. 2.....	7¢ 10¢11%
Washita Slips, No. 1, Extra.....	7¢ 30¢38%
Washita Slips, No. 1.....	7¢ 24¢26%
Arkansas Stone, No. 1, 4 to 6 in.....	7¢ 11¢50
Arkansas Stone, No. 1, 6 to 9 in.....	7¢ 11¢50
Turkey Oil Stone, 4 to 8 in.....	7¢ 10¢40%
Turkey Slips.....	7¢ 11¢0¢10%
Lake Superior, Chase.....	7¢ 16%
Lake Superior Slips, Chase.....	7¢ 31¢32%
Seneca Stone, Red Paper Brand.....	7¢ 20¢25%
Seneca Stone, High Rounds.....	7¢ 20¢25%
Seneca Stone, Small Whets.....	7¢ 30¢40%
<b>Stone Polish—</b>	
Joseph Dixon's.....	7¢ 30¢10%
Gem.....	7¢ 40¢10%
Gold Medal.....	7¢ 30¢10%
Mirror.....	7¢ 30¢10%
Lustro.....	7¢ 30¢10%
Ruby.....	7¢ 30¢10%
Rising Sun, 5 gro lots.....	7¢ 30¢10%
Dixon's Plumbago.....	7¢ 30¢10%
Boydton's Noon Day.....	7¢ 13.00
Parlor Pride Stove Enamel.....	7¢ 30¢10%
Yates' Liquid.....	7¢ 30¢10%
Yates Standard Paste Polish, 10-lb cans.....	7¢ 15%
Jet Black.....	7¢ 30¢10%
Japanese.....	7¢ 30¢10%
Firestone.....	7¢ 30¢10%
Diamond O. K. Enamel.....	7¢ 30¢10%
Bonnell's Liquid Stove Polish.....	7¢ 30¢10%
Bonnell's Paste Stove Polish.....	7¢ 30¢10%
Black Eagle Benzine Paste, 5 and 10 lb cans.....	7¢ 12½%
Black Jack Water Paste, 5 and 10 lb cans.....	7¢ 12½%
Nickel Plate Paste.....	7¢ 30¢10%
<b>Tacks, Brads, &amp;c.—</b>	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80¢80¢5%
Steel Carpet.....	80¢80¢5%
Swedes Iron Carpet.....	80¢80¢5%
American Iron Cut.....	75¢75¢10%
Swedes Iron.....	75¢75¢10%
Swedes Iron, Upholsterers.....	75¢75¢10%
Tinned Swedes Iron.....	75¢10¢75¢10%
Tinned Swedes Iron, Upholsterers.....	75¢10¢75¢10%
Gimp and Lace.....	75¢10¢75¢10%
Tinned Gimp and Lace.....	75¢10¢75¢10%
Swedes Iron Trimmers.....	75¢10¢75¢10%
Swedes Iron Miners.....	75¢10¢75¢10%
Swedes Iron Bill Posters or Railroad.....	75¢10¢75¢10%

<b>Swedes Steel (Swedes Iron price list).</b>	
Copper Tacks.....	50¢10%
Copper Finishing, Trunk and Clout Nails.....	50¢10%
Finishing Nails.....	70¢10¢70¢10¢10%
Trunk and Clout Nails.....	70¢10¢70¢10¢10%
Tinned Trunk and Clout Nails.....	70¢10¢70¢10¢10%
Basket Nails.....	70¢10¢70¢10¢10%
Common and Patent Brads.....	70¢10¢70¢10¢10%
Hungarian Nails.....	70¢10¢70¢10¢10%
Chair Nails.....	70¢10¢70¢10¢10%
Zinc Glaziers' Points.....	50¢50¢5%
Cigar Box Nails.....	50¢10¢50¢10¢5%
Picture-Frame Points.....	50¢10¢50¢10¢5%
Looking-Glass Tacks.....	50¢10¢50¢10¢5%
Leathered Carpet.....	50¢10¢50¢10¢5%
Brush Tacks.....	50¢10¢50¢10¢5%
Shoe Finders, List Jan. 2, 1888.....	10¢10%
Lining and Saddle Nails, List Jan. 1, 1888.....	30¢10¢10%
Silvered.....	30¢10¢10%
Japaned.....	30¢10¢10%
Double-Fointed Tacks.....	30¢10%
Wire Caps, Nails.....	50¢10%
Wire Brads & Nails, see Nails, Wire.	
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....	50¢10%
<b>Tap Borers—</b>	
Common and Kind.....	20¢10%
Irish Tap Borers.....	35¢10%
Enterprise Mfg. Co.....	20¢10¢3%
Clark's.....	33¢38%
<b>Tapes, Measuring—</b>	
American.....	25¢10%
Spring.....	35¢10%
Chesterman's, Regular list.....	25¢30%
<b>Thermometers—</b>	
Tin Case.....	80¢80¢10%
<b>Thimble Skins—See Skins.</b>	
<b>Ties, Bale-Steel</b>	
Standard Wire, list.....	50¢10¢5%
<b>Tinners' Shears, &amp;c.—</b>	
Shears and Snips (P. S. & W.).....	20¢25%
Punches, see Punches.	
Snips, J. Mallinson & Co.....	33¢1%
<b>Tinware—</b>	
Stamped, Japaned and Plated, list Jan. 2, 1887.....	75¢75¢5%
<b>Tire Benders, Upsetters, &amp;c.—</b>	
Stoddard's Lightning Tire Upsetters.....	15%
Detroit Perfected Tire Bender.....	15%
<b>Tobacco Cutters—</b>	
Champion.....	20¢10¢30%
Wood Bottom.....	50¢50¢5%
All Iron.....	70¢40%
Nashua Lock Co's.....	50¢50%
Wilson's.....	55%
Sargent's.....	55%
Acme.....	50¢50%
<b>Transom Lifters—</b>	
Wollensak's.....	50%
Class 3 and 4, Bronze Iron.....	50%
Class 3 and 4, Bronze Metal.....	25%
Class 3 and 4, Brass.....	35%
Skylight Lifters.....	35%
Crown, Eagle and Shield.....	50%
Reiter's, list Jan. 1, 1887.....	50¢10¢3%
Bronzed Iron Rods.....	30%
Brass, Real Bronze or Nickel Plate.....	30%
Excelsior.....	50¢10¢2%
Shaw's.....	50¢10%
Payson's Universal.....	40¢40¢10%
<b>Traps—</b>	
<b>Game—</b>	
Newhouse.....	35¢40¢5%
Oneida Pattern.....	70¢70¢5%
Game, Blake's Patent.....	40¢10¢5%
<b>Mouse and Rat—</b>	
Mouse, Wood, Choker, 7 do holes, 11 to 12.....	7¢ 15.00
Mouse, Round Wire.....	7¢ 15.00
Mouse, Cage Wire.....	7¢ 15.00
Mouse, Catch-em-alive.....	7¢ 15.00
Mouse, "Bonanza".....	7¢ 15.00
Mouse, Delusion.....	7¢ 15.00
Rat, "Decoy".....	7¢ 15.00
Cyclone.....	7¢ 15.00
Hotchkiss Metallic Mouse, 5-hole traps.....	7¢ 15.00
In full cases.....	7¢ 15.00
<b>Trowels—</b>	
Lothrop's Brick and Plastering.....	25%
Reed's Brick and Plastering.....	15%
Dixon's Br'k and Plastering.....	25¢25¢10%
Pease's Plastering.....	25%
Clement & Maynard's.....	20%
Rose's Brick.....	15¢20%
Wardell's Brick and Plastering.....	20%
Garden.....	70%
<b>Triers—</b>	
Butter and cheese.....	25%
<b>Trucks, Warehouse, &amp;c.—</b>	
B. & L. Block Co.'s list, '82.....	40%
<b>Tubes, Boiler—</b>	
See Pipe.	
<b>Twine—</b>	
Flax Twine.....	BC. B.
No. 8, ¼ and ½ B Balls.....	22¢ 28¢
No. 10, ¼ and ½ B Balls.....	21¢ 28¢
No. 12, ¼ and ½ B Balls.....	18¢ 28¢
No. 14, ¼ and ½ B Balls.....	18¢ 28¢
No. 16, ¼ and ½ B Balls.....	16¢ 27¢
No. 24, Mattress, ¼ and ½ B Balls.....	48¢50¢
Chalk Line, Cotton, ¼ B Balls.....	25¢
Mason Line, Linen, ¼ B Balls.....	55¢
2-Ply Hemp, ¼ and ½ B Balls (Spring Twine).....	11¢
3-Ply Hemp, 1 B Balls.....	12¢12½¢
3-Ply Hemp, 1½ B Balls.....	11¢11½¢
Cotton Wrapping, 5 Balls to lb.....	15¢10¢
2, 3, 4 and 5-Ply Jute, ¼ B Balls.....	10¢
Wool.....	6¢14¢
Paper.....	3¢14¢
Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢

<b>Vices—</b>	
Solid Box.....	60¢60¢5%
<b>Parallels—</b>	
Fisher & Norris Double Screw.....	15¢10%
Stephens.....	25¢30%
Parker's.....	20¢25%
Wilson's.....	55%
Howard's.....	40%
Bonney's.....	40¢10%
Millers Falls.....	40¢40¢10%
Trenton.....	40¢50¢40¢10%
Merrill's.....	15¢20%
Sargent's.....	60¢10¢10%
Backus and Union.....	40%
Double Screw Leg.....	15¢10%
Prentiss.....	30¢5¢25%
Simpson's Adjustable.....	40%
Moore's.....	30%
<b>Saw Vices—</b>	
Bonney's, Nos. 2 & 3, \$15.00.....	40¢10%
Stearns.....	35¢10¢33½¢10¢10%
Stearns' Silent Saw Vices.....	35¢10%
Sargent's.....	60¢10%
Reading.....	70¢10%
Wentworth.....	40¢10%
Combination Hand Vices.....	7¢ gr \$42.00
Cowell Hand Vices.....	20%
Bauer's Pipe Vices.....	10%
<b>Wagon Boxes—</b>	
Per B.....	2½¢
<b>Wagon Jacks—</b>	
Daisy.....	35%
<b>Washer Cutters—</b>	
Smith's Pat.....	70¢12.00, 20¢10¢10%
Johnson's.....	70¢11.00, 35¢10%
Penny's.....	70¢11.00, 35¢10%
Appleton's.....	70¢11.00, 35¢10%
Bonney's.....	70¢11.00, 35¢10%
<b>Washers—</b>	
Size.....	1/8 5-16 3/8 1/2 5/8 3/4 1
Washers.....	7 5/8 1/4 3/8 3/4 5/8 3/4
In lots less than 200 lb, 7¢ add 1/8¢, 5-lb boxes 1¢ to list.	
<b>Wedges—</b>	
Iron.....	7¢ 3½¢
Steel.....	7¢ 4¢
<b>Well Buckets, Galvanized—</b>	
Hill's.....	70¢12.00, 14 qt. \$5.25
Don Ch.....	70¢12.00, 14 qt. \$4.25
Whiting's Flat Iron Band.....	\$4.25¢4.50
Whiting's Wired Top.....	70¢12.00, 4.25
<b>Well Wheels—</b>	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
<b>Wire—</b>	
<b>Iron—</b>	
Market.....	





# THE IRON AGE

THURSDAY, JUNE 20, 1889.

## Transmission of Power in Mining.

The cost of transmitting power through long distances to reach the point at which it has to be applied in mines has very often proved to be prohibitory of the adoption of mechanical agencies. A method has recently been tried with success at the Spring Hill (Nova Scotia) mines, which, under certain conditions, promises to overcome many of the costly difficulties arising both from excessive friction in some cases of applying power and from leakage in others. The depth below the surface at

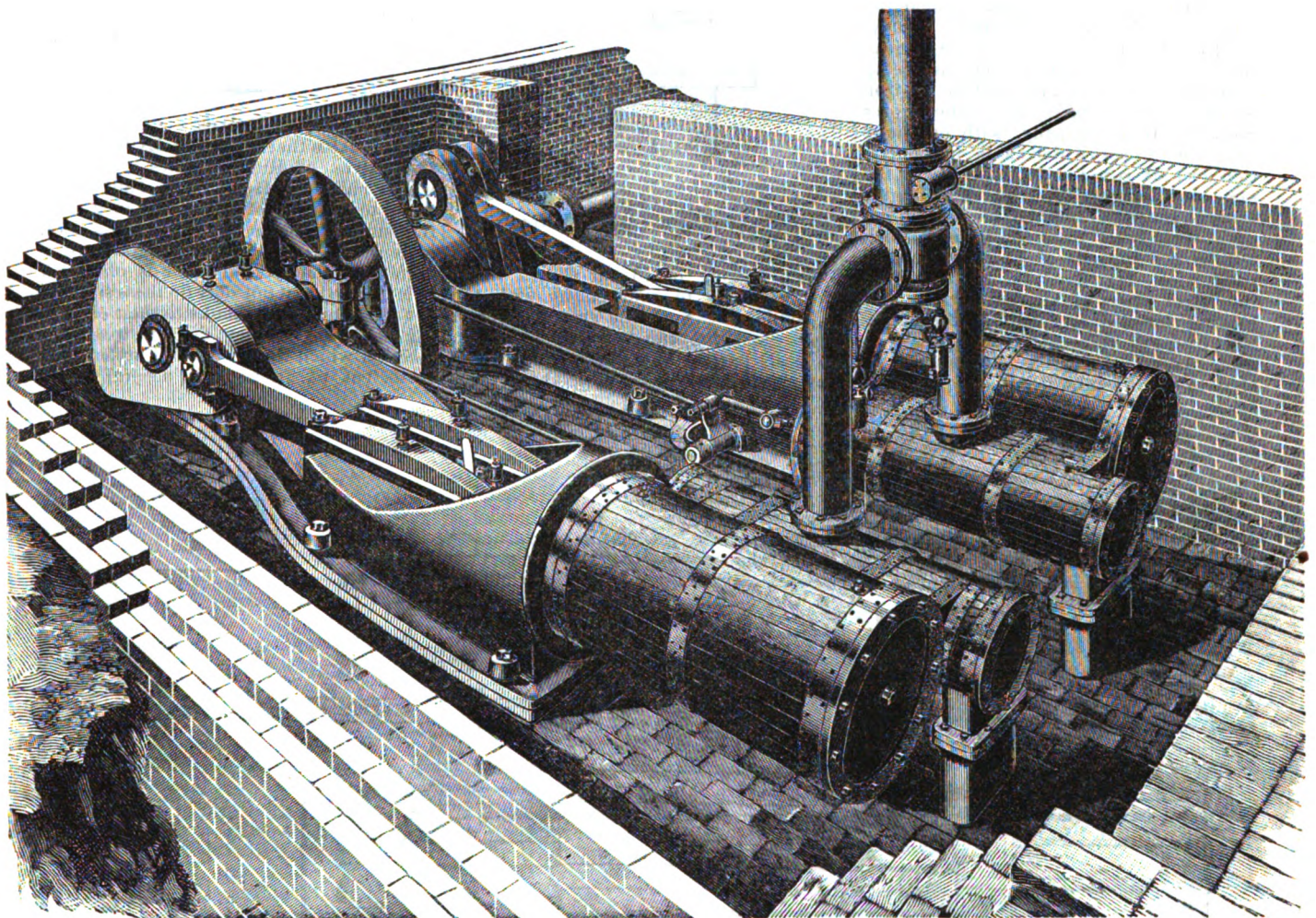
may be of ready application, and its simplicity and economy in such cases can hardly fail to recommend its adoption. It would probably be found in practice that 600 feet perpendicular need not be held as the limit of depth at which such a system could be economically applied.

**Canada's Iron Production in 1888.** Advance sheets of the annual report of Mr. E. Costa, in charge of the Mineral Statistics Division of the Geological Survey of Canada, give the following state-

was \$16,500,000, as against \$12,959,078 in 1887, but in reality \$1,847,102 of this increase is a miscellaneous item not included in last year's returns.

## The Latrobe Steel-Works Engines.

We here present illustrations of the engines for the tire mill of the Latrobe Steel Works, of Latrobe, Pa. These engines were designed and built by William Tod & Co., of Youngstown, Ohio, in accordance with the general specifications of



THE LATROBE STEEL-WORKS ENGINES, BUILT BY WILLIAM TOD & COMPANY.

the point where the power was required to be applied being but 600 feet, a bore of 4 inches in diameter was made directly above that point, and an endless wire rope being lowered through it and passed over a pulley at the bottom, the power of a steam-engine at the ground level was by this means transmitted directly to the workings below. It had been calculated that the cost of this bore-hole would be considerably less than the prime cost of the 1800 feet of steam-pipe which would have been required to reach the working point, while loss by leakage and repairs required to such a length of suspended piping were further saved. The diameter given to the bore is said to be ample for the rope to work without friction, as also to admit of a signal rope being placed with it to enable the workmen in the mine to communicate with the driver of the engine above. There are many cases where this novel method

ment regarding the iron and steel production of the Dominion for 1888 :

	Tons (2000 pounds).	Value.
Iron ore .....	44,410	\$139,393
Pig-iron.....	18,191	226,443
Rolled and forged iron	40,962	1,442,974
Steel.....	9,508	470,819

The production of iron ore has fallen off in recent years, it is said, on account of the presence of sulphur in the ore, rendering it in a measure unmarketable. This is particularly true of the Coe Hill mines, owned largely by Americans. The statement as to the production of rolled and forged iron includes four rolling-mills, one forge and the Londonderry Iron Works, but returns have not yet been received from six similar works. The total manufacture of iron will, however, be much larger than that of last year. Nominally, the value of all Canadian mineral products for 1888

Julian Kennedy, chief engineer of the Latrobe Steel Works.

As the work requires frequent stopping and starting it was necessary to use coupled engines, and as direct connection was desired one of the engines is made center-crank. The beds are of the Porter type, similar to that of the Porter-Hamilton engine as made by the builders. The valves are of the piston type, with large and direct steam openings, and have a travel of 6 inches. The cylinders are placed 8 feet 8 inches between centers, and are 26 inches in diameter, the stroke being 42 inches. The shaft is 12 inches in diameter, and the fly-wheel 8 feet in diameter. The admission of steam is controlled by a single-piston throttle-valve, which we show in section in the small drawing. The large drawing shows clearly the form and arrangement of the principal parts of the engine.

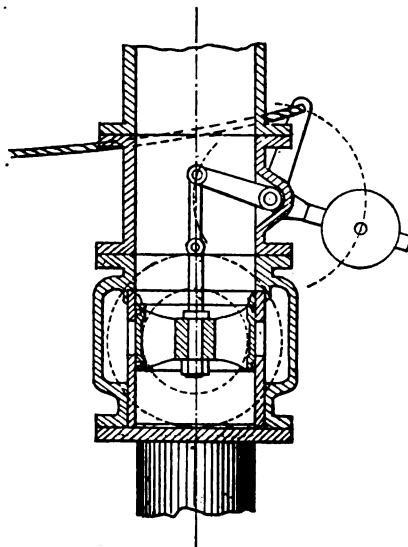


### The Industries of Southwest Virginia.

In a letter to the *Manufacturers' Record* Mr. Chas. G. Eddy, of Roanoke, who, as vice-president of the Norfolk and Western Railroad, has done so much for the advancement of Southwest Virginia, writes as follows:

There has never been established upon our line a manufacture that has not prospered, and the developments in the next 12 months will be as remarkable as anything in the past. We desire no "boom;" we want manufactures. Steady, honest, successful growth has been displayed by the city of Roanoke in the last seven years, jumping from a village of 450 people to a city of 15,000 population. It has the finest water-works system in the State, gas-works and electric plant; street railway now being built; locomotive and car works employing from 900 to 1000 men; rolling-mill manufacturing bar-iron, angle-iron, bridge iron and small rails, employing from 150 to 200 men; the American Bridge and Iron Works, now just being completed, for the manufacture of iron bridges, blast-furnaces, &c.; the Crozer Steel and Iron Company, with one large coke iron furnace (which has been in operation over six years) and a duplicate of the same now being erected, which will give them an output of 800 tons of pig-iron per day; basic steel plant projected which will have a capacity of 15 to 20 tons of basic steel per day, to be converted into steel plates of all descriptions, but looking forward especially to furnishing steel plates to ships at Norfolk, the Virginia navy-yard that will eventually be able to build ships using only material

Ivanhoe, on the Cripple Creek line, a furnace has been in operation only six months, and most successfully. And so on to the State line at Bristol is found an unlimited supply of ore, backed by the best coke in the world—the Pocahontas or Flat Top.

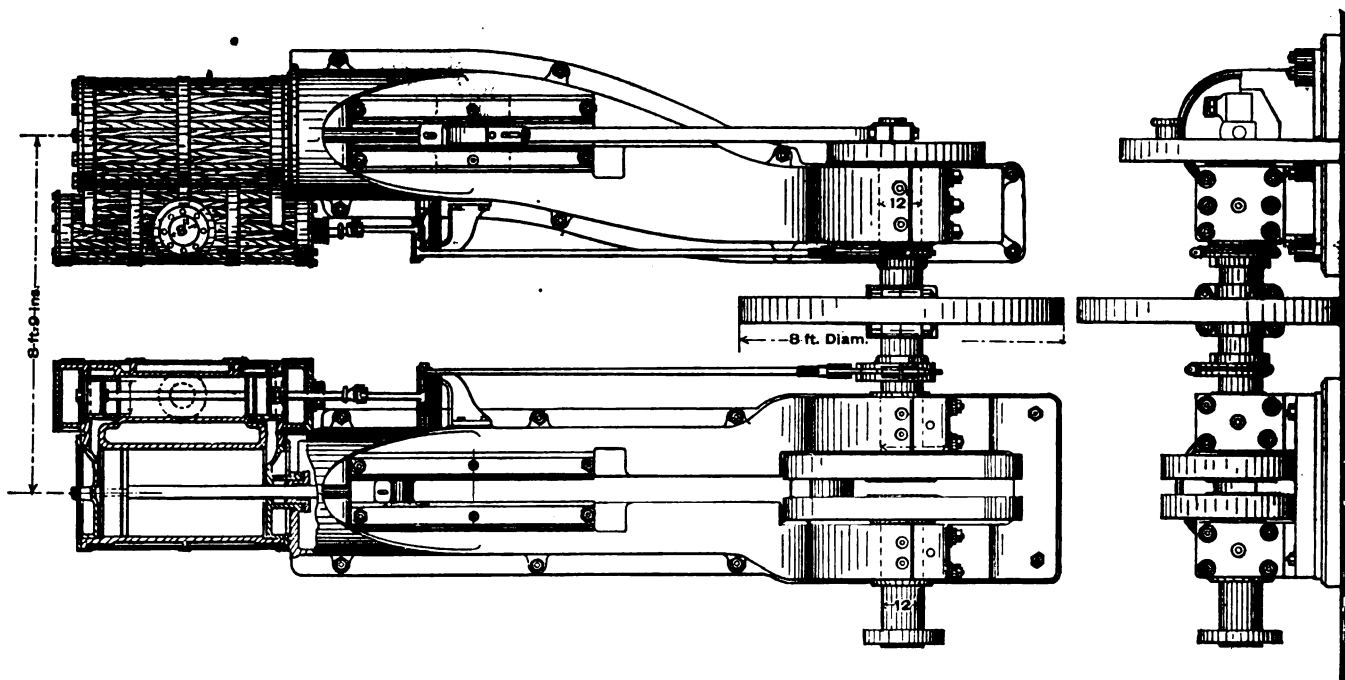


Single-Piston Throttle-Valve.

Then passing on to our Clinch Valley line, which is to connect us with the Louisville and Nashville system through Cumberland Gap, the development of iron ore, coal, barytes and other minerals has been most extraordinary up to the present

grounds will comprise 45 acres, and there will be exhibited railway rolling-stock and railway appliances, electric light, power and other electrical devices, and all kinds of implements, tools, &c. The buildings and grounds will be opened for the reception of articles from the 5th of August. Some facts are stated by the association which are of interest. They say that St. Joseph is in the geographical center of the United States, being 1400 miles from Boston, 1400 from San Francisco, 700 from Galveston and 700 from the north line of the United States. It is in the center of the territory comprising the four great States of Kansas, Nebraska, Iowa and Missouri, claimed to be "the richest country in natural resources on the face of the earth." Within a radius of 200 miles from St. Joseph there is a population of 4,000,000 people, while the city itself contains 75,000. The fruit and agricultural display will undoubtedly be one of the finest ever made, owing to the richness of the agricultural section in which the city is located.

**Chilled Slide-Valves.** — *L'Ingenieur-Consail* states that M. Bollinckx is casting the valves of Rider engines in a mold which chills the faces. The chill penetrates to a depth of  $\frac{1}{4}$  inch to  $\frac{1}{2}$  inch. As the surface cannot be cut with a tool, it is ground with emery rollers until a perfect true and polished face is obtained. It is claimed that not only do these surfaces not wear, but that, thanks to their exceeding smoothness, they do not wear the faces on which they work. Further, the coefficient of friction is naturally very



THE LATROBE STEEL-WORKS ENGINES.—SECTIONAL-PLAN VIEW AND END ELEVATION.

manufactured from the products of the mines and mills in Virginia; an additional iron furnace projected, which will probably be built within the next 12 months. The development of iron-ore properties within 20 miles of Roanoke in the past year has been unparalleled in the history of Virginia mines.

Passing on to Radford, there are two furnaces projected at that point, which will in all probability be built this year. At Pulaski is the Pulaski Iron Company's furnace, which has been more successful than any other furnace in the South, and has only been in operation one year; there are ten zinc furnaces at that point and additional furnaces projected. At

time, and will be exceeded as the prospecting goes on. I claim that Southwest Virginia is the best district for successful manufacturing in the United States, not excepting the Birmingham district.

The National Railway, Electrical and Industrial Exposition Association, of St. Joseph, Mo., will hold an exposition at that place this fall, commencing on the 3d of September and closing on the 5th of October. Every effort will be made to have this exposition attain a standing of national importance. The main building for machinery and other exhibits will have a floor space of 80 x 1040 feet. The amphitheater will seat 10,000 people. The

small. The administration of the State railways has sent a representative to examine the application of the mode of construction to the slide-valves of locomotives. The plan of chilling the slide-valves of engines has been tried in this country on a small scale, and has been found to work well.

The leading railroad lines from Chicago agreed to a reduction in rates on iron bound eastward, to correspond with the cut on west-bound shipments. The rate to Buffalo is reduced from \$2.50 to \$2.20 a ton; to Cleveland, from \$2 to \$1.60; to Detroit and Toledo, from \$1.70 to \$1.40, and so on.



## Use of Softeners in Foundry Practice.

BY WALTER GRAHAM, BELLEFONTE, PA.

When the furnace of the Bellefonte Furnace Company, at Bellefonte, Pa., went into blast, owing to the irregularity of the silicious hematite ores and of the limestone used, a small amount of pig-iron, containing from 8 to 6 per cent. of silicon, was made before the stock and burden could be regulated. This iron contained of combined carbon 0.25 per cent.; graphitic carbon, 8 per cent.; total carbon, 3.25 per cent.; silicon, 8 to 6 per cent.; phosphorus, 0.85 per cent.; sulphur, 0.02 per cent.; manganese, 0.50 per cent. The iron containing the highest percentage of silicon was quite light in color, and was readily disposed of as silvery or carbonized iron. The lower silicon iron was not wanted, because it was, "strictly speaking, not a carbonized iron," or because it was not well-grained No. 1 and No. 2 foundry iron; "iron being bought from its fracture and not from analysis," as we were informed. This iron has been graded from analyses, according to its percentage of silicon, as No. 1 soft and No. 2 soft foundry iron. It has little or no grain and is very soft under the drill or chisel. At 3.25 per cent. silicon the iron is dark, growing lighter in color as the silicon is increased. No. 1 soft contains 3.25 per cent. silicon and is dark with some grain. No. 2 soft contains 3.50 to 4 per cent. silicon and is dark and close-grained. With the easily reduced silicon hematites of the Buffalo Run Valley, containing iron 85 to 50 per cent.; silica, 18 to 40 per cent.; sulphur, 0.02 to 0.04 per cent.; phosphorus, 0.08 to 0.16 per cent., and manganese, 0.50 to 0.70 per cent., these two grades of iron can be readily made when the furnace is on No. 1 foundry iron by an increase in the temperature of the furnace, produced from a variation of 50 pounds in the burden and an increase of 2 per cent. of silica in the cinder.

I was convinced from its analysis that this iron would prove most useful in foundry work, and, for reasons to be stated further on, believed it to be an ideal softener. I tried to explain to several foundrymen, in chemical terms, how it could be used to advantage. My explanation of the proportions of chemical elements in the iron and their effect when remelted with other irons was generally interrupted with the remark that "they were not chemists, and so did not understand that sort of thing." "Their experience had, as a rule, been that an iron that was well grained out to the edge of the pig was a soft, strong iron, and for such an iron, when they found it to suit their purpose, they did not mind paying an extra dollar a ton." The experience of intelligent consumers of pig-iron cannot be neglected, and men who pay an extra price for an iron for a special purpose must have satisfied themselves that it is worth the money. An experience of several years in the laboratory and steel-works of one of the largest steel companies in the country and the subsequent change of two little Bessemer plants led me to believe, however, that chemical analysis is the best guide that we have for the use and manufacture of iron in any form.

Recently I went to the shop of one of the foundrymen spoken of above to examine a broken casting. Pieces of a very hard and brittle pulley were shown me, and I observed on a lathe a pulley of the same pattern that had been on the lathe all day and was not yet turned up. After seeing their iron and scrap pile, I asked them to let me send them a few tons of the high-silicon and low-phosphorus iron described above. They cast from it a strong, soft pulley that was machined in three hours. They gave an order for two

cars of this iron, to be delivered at once, and although the grain of the iron was not open, they declared themselves satisfied. Since then they have used it in various proportions. A spur-wheel containing 1800 pounds charcoal iron and 1800 pounds No. 2 soft Bellefonte gave unusual strength and softness.

In many foundries nothing is known of the chemical elements in the irons used by them or in the castings made, and they have no chemical standards or formulas for the different classes of castings; their only guide in purchasing and using pig-iron being the fracture. Such practice seems to be very much behind the age of steel, but it prevailed in the age of iron, and still greatly prevails among the users of pig-iron. Pig-irons containing the same amounts of combined carbon and graphitic carbon and other elements may have different fractures, and irons having different fractures may contain the same amounts of the chemical elements that affect the quality of the iron.

Close-grained iron is found in the same cast as opened-grained iron. Foundry iron run rapidly from the furnace will usually have an open grain, while iron which is allowed to run slowly will have a close grain. In either case the iron only differs in appearance, even the amounts of graphitic and combined carbon being practically the same. Were iron bought and sold on analysis this would become evident.

Professor Turner says: "There is a suitable proportion for each constituent present in cast-iron. This proportion depends upon the character of the product which is desired and upon the proportions of the other elements present." The neglect of this law is the reason why two or three high-grade and costly irons melted together may give weak castings. It is by careful attention to the mixing of low-grade irons, scrap and high-silicon irons, so that the proper proportion of each constituent is produced, that strong castings are made from what was considered inferior material.

The knowledge of the effect of the several elements, carbon, silicon, manganese, phosphorus and sulphur, on cast-iron would be most valuable to foundry men, as by it they might save the extra dollar spoken of above paid for an imported or well-known brand to insure them in getting the proper proportion of the constituents ready made. They would also save many extra dollars thrown away on worthless castings and time wasted in machining iron that is too hard. They could use more low-grade irons and scrap, and having an exact and scientific language in which to communicate their wants to the furnace men they would receive what they are in search of.

This need of a common language, so to speak, between the producers and users of pig-iron has been frequently urged. As the best literature on the subject deals with the chemical analyses of iron and valuable deductions and conclusions have been drawn from them, the knowledge and use of a few chemical terms seem necessary in an intelligent discussion of the qualities of iron.

The labors of Mr. W. J. Keep, of Detroit, and others recently; the experiments and conclusions of Colonel Caron, of France; Professor Turner, of England; M. Ferd. Gautier, of Paris, and other European writers on the qualities of cast-iron, have been republished in our trade journals. These, with Mr. Keep's and his associates' experiments and the discussions to which they have given rise, have opened to all in this country the scientific treatment of the subject. The following are some of the most recent and accessible papers and discussions that are useful to those interested in the manufacture and use of pig-iron:

"The Constitution of Cast-Iron," Professor Turner, England; "Silicon in

Foundry Iron," M. Ferd. Gautier, Paris. The papers of Mr. W. J. Keep and his associates, Mr. H. S. Fleming, Prof. C. F. Mabery, Mr. L. D. Vorce and Mr. Ed. Orton in *The Iron Age* and *Journal of Charcoal Iron Workers*. The contributions of Messrs. C. A. Meissner, A. E. Hammer, E. S. Cook, S. H. Chauvenet and J. Birkenbine, to *The Iron Age*. In the *Journal of the British Iron and Steel Institute*, by Messrs. Ed. Riley, Thos. Turner, I. L. Bell, Dr. Percy, Prof. Miller, Chas. Wood, Sir Fred. Abel, Sir W. Fairbairns and others. The above, which occur to me as I write, and many more which I need not name, give much information, which when read in connection with the practical knowledge of iron obtained in the foundry and shops will prove of great value commercially.

Going further into the subject, the researches of Herr Martens, Dr. Herman Wedding, Mr. F. Linwood Garrison, Dr. H. C. Sorby and others, in the microscopic structure of iron and steel, are of great interest. To those who read German, the papers and discussions in *Stahl und Eisen* and the works of Akerman, Karsten, Ledebur, Mueller, Von Tunner, Wachler, Wedding and others will present themselves. While the above list is familiar to many readers of *The Iron Age*, I have found that many to whom the above discussions might prove of value in dollars and cents in their business consider that they are only matters concerning chemists, and so remain ignorant, or very nearly so, of what concerns themselves.

Although there is much that is fragmentary and conjectural written about cast-iron, yet there have been conclusions drawn and clearly stated that have been applied in the most wide-awake foundries and mills to their profit. They have fallen into line with the steel-works and furnaces supplying steel-works, and are operating understandingly on a scientific basis. It remains for the iron trade generally to adopt standards and chemical formulas and an exact language in common to express their wants. The subject of softeners has been treated upon largely by the writers referred to, and the use of Scotch pig or imitation of Scotch pig, containing, generally, high silicon, phosphorus and manganese and of ferro-silicons containing very high percentages of silicon and low carbon, is becoming more and more frequent. It may be well to state broadly the effect, as now understood, of the elements carbon, silicon, phosphorus, manganese and sulphur on iron and on each other when present in iron.

### CARBON.

Carbon being considered the most important of the constituents of cast-iron comes first in the list. Professor Turner takes as a standard the average British cast-iron, which contains 3.4 per cent. of total carbon. One of the best brands of foundry iron in our market contains of silicon, 2.43 per cent.; phosphorus, 0.84 per cent.; sulphur, 0.02 per cent.; manganese, 0.24 per cent.; combined carbon, 0.40 per cent.; graphitic carbon, 3.12 per cent.; total carbon, 3.52 per cent. Bellefonte No. 1 foundry iron contains of silicon, 2.60 per cent.; phosphorus, 0.85 per cent.; sulphur, 0.03 per cent.; manganese, 0.50 per cent.; combined carbon, 0.30 per cent.; graphitic carbon, 3.18 per cent.; total carbon, 3.48 per cent. Carbon exists in cast-iron as combined carbon and graphitic carbon. In the molten state the metal is supposed to contain carbon as combined carbon or carbide of iron. The strength of irons low in phosphorus and sulphur depends upon the proper proportion of combined carbon and graphitic carbon.

### COMBINED CARBON.

Combined carbon in cast-iron increases its hardness and brittleness. Metal that

contains much combined carbon shrinks more in cooling than metal containing its carbon in the graphitic state. Sudden cooling of metal prevents the separation of carbon as graphite, and retains it in the state of combination with the iron. Successive remelting of iron increases the amount of combined carbon. Carbon discovered that combined carbon is replaced by silicon. Gautier and Akerman conclude that combined carbon is replaced by silicon, and the carbon, being separated from the iron, is precipitated as graphite; therefore silicon added to iron produces graphite, and when silicon is taken from iron combined carbon is formed. Irons low in silicon generally contain much combined carbon.

The presence of sulphur or manganese promotes the formation of combined carbon, as they act in a contrary direction to silicon. So "any required proportion of combined carbon may be obtained by altering the amount of silicon on one hand and the amount of manganese and sulphur on the other." Small variations in the amount of combined carbon are important. Professor Turner gives 0.40 per cent. of combined carbon as the figure at which the maximum general strength is obtained. "The metal being sufficiently soft to work with a tool and the crushing and tensile strengths being high." His conclusions as to the best proportions for the constituents of cast-iron are drawn from the Woolwich experiments.

#### GRAPHITIC CARBON.

Carbon existing as graphite in cast-iron makes it soft and tough. Mr. F. L. Garrison observed under the microscope that strong iron contained graphite in an irregular mass of fine black lines, evenly distributed throughout the mass. In the weaker irons the graphite was in irregular and somewhat isolated patches of comparatively large size, and without any regular grouping. When the constituents are in the proper proportion and the metal not suddenly chilled, the change of carbon from the combined to the graphitic state occurs at the instant of crystallization, which causes the carbon thus liberated to be distributed uniformly throughout the mass of metal, thus preventing these weakening spots.

Professor Turner deduces from the Woolwich experiments for crushing strength that graphite should be under 2.6 per cent.; for general strength it should be about 2.8 per cent.; for strength and softness it should be about 3 per cent.; for softness it should be over 3.10 per cent, when the total carbon is 3.4 per cent.

(To be continued.)

A need of better facilities for the handling of supplies and products in large manufacturing establishments has led to the adoption of tramway cars propelled by electric motors. A greater part of the large mills being supplied with electric-light systems renders this an easy matter, and it is safe to predict that before long the electric tramway will come to be considered a necessary feature in mill equipment. The Thomson-Houston Electric Company have already equipped several tramways and have contracted for others which will soon be put in operation. The tramway car at the company's works in Lynn is used for carrying heavy machinery to different parts of the factory, and its use permits the handling of apparatus with much greater ease in less time and with less labor than could possibly be accomplished by any other method. The car is equipped with two 3 horse-power motors, and easily carries up a grade of 13 per cent. a load of 5 tons, while from 8 to 10 tons can be carried on a level. The motors receive their current through an overhead wire from one of the generators in the factory.

## THE ENGINEERS ABROAD.

(Editorial Correspondence.)

The greater number of the party of American engineers who joined the excursion to England and France left New York on the City of Richmond, Saturday, May 25, steaming down the harbor amid the cheers and farewell salutes of numerous friends. As soon as the high seas were reached it became evident that high attainments in steam engineering, iron-smelting, mining or machine construction are by no means a guarantee against the discomforts caused by an unstable equilibrium, although woeful countenances were generally explained by the grief occasioned by departure from home and friends. A few days of smooth sailing, as comfortable as a trip on a new boat, brought smiles to tearful countenances and appetites to the most dyspeptic. The engineers and their ladies whiled away the intervals between meals, the four great events of the day, as best suited their tastes. Special efforts were generally made to make the evenings memorable; a dance, a concert, an initiation into the Order of Neptune following one another in rapid succession. To a number of the members of the party frequent committee meetings caused additional diversion, the object being to arrange for a provisional organization. Subject to confirmation by the party on the City of New York, the following joint committee was appointed: Henry R. Towne, of Stamford, Conn., president; S. J. Whittemore, O. Chanute, C. J. H. Woodbury, of Boston; Alfred E. Hunt, of Pittsburgh, Pa.; S. W. Baldwin, agent Pennsylvania Steel Company at New York; John T. Hawkins, Campbell Printing Press Company, of Taunton, Mass.; Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.; Alexander Dempster, W. H. Wiley, of New York; William Forsyth, C. B. and Q. Railroad, Aurora, Ill.; Herbert G. Terry, U. S. Assay Office, New York; C. E. Emery, New York Steam Heating Company, New York; C. Kirchhoff, Jr., editor *The Iron Age*, secretary.

Just before departing invitations were received from a committee of Liverpool engineers to take part in one of two excursions arranged for Thursday, the day following the probable date of arrival of the City of Richmond. One of these excursions is to be conducted under the auspices of the Liverpool Dock Estates Trust, and the other is to visit the famous ship-building yards of Laird Brothers, at Birkenhead, opposite Liverpool, going from there to the pumping and ventilating plant of the great Mersey Tunnel. In the evening a reception is to be held at the Liverpool Town Hall by the mayor of the city. On Friday the members divide into a number of groups who will spend the Whitsuntide holidays amid the mountains of Wales or the charming lake region.

It is only natural, since the trip was originated by the American Society of Mechanical Engineers and was principally pushed by the officers of that body, that the greater number of gentlemen in the party are identified with it. Among those who sailed on the City of Richmond are: Robert Allison, of the Franklin Iron Works, Port Carbon, Pa.; D. L. Barnes, consulting engineer, of Chicago, who has lately designed steel cars for the Illinois Steel Company; G. H. Barrus, of Boston, Mass.; W. H. Baldwin, manufacturer of bolts and nuts at Youngstown, Ohio; S. W. Baldwin, of the Pennsylvania Steel Company; C. S. Beach, Bennington, Vt.; M. A. Beck, Chicago, Ill.; Jerome L. Boyer, Chestnut Hill Iron Ore Company, Reading, Pa.; Morgan Brooks, St. Paul Gas Light Company; W. D. Caldwell, cot-

ton manufacturer, Nashua, N. H.; F. A. Canfield, of Dover, prominently connected with New Jersey iron ore interests; R. E. Curtis, Newburyport, Mass.; C. M. Collins, of Studebaker Brothers, South Bend, Ind.; James Christie, chief engineer Pencoyd Iron Works, Philadelphia; F. H. Daniels, Washburn & Moen Mfg. Company, Worcester, Mass.; E. V. D'Inville, of the Second Geological Survey of Pennsylvania; Fred. P. Dewey, curator of metallurgy, National Museum, Washington, D. C.; W. V. Fairbairn, chief boiler inspector of Massachusetts; Robert Fraser, mining engineer, of Philadelphia; Edward O. Goss, Scovill Mfg. Co., Waterbury, Conn.; George A. Gray, manufacturer of tools, Cincinnati; G. N. Hewitt, Aspen, Col.; O. S. Harmon, of Brooklyn, who is connected with the Lorillards, of Jersey City; William Hill, Collins Company, Collinsville, Conn.; H. D. Hibbard, steel melter, of Pittsburgh, Pa.; Edwin T. Howard, fire-brick manufacturer, of St. Louis; Chas. E. Hyde, of Bath, Maine, who is interested in marine engineering and ship-building; Frank E. Kirby, who is similarly engaged at Detroit, Mich.; Prof. D. S. Jacobus, of the Stevens Institute of Technology; W. T. Magruder, of Vanderbilt University, Tenn.; G. T. Alden, of the Worcester Polytechnic Institute; Allyne L. Merrill, Edward T. Miller and Peter Schwamb, of the Massachusetts Institute of Technology; F. F. Sharpless, of the Michigan Mining School; E. P. Jennings, of Stambaugh, Mich.; William Kent, of the Springer Torsion Balance Company, Jersey City, N. J.; Chas. Kirchhoff, Jr., editor *The Iron Age*, New York; G. Lavagnino, engineer of the Old Telegraph Mine, Salt Lake City, Utah; Edwin Mickle, Thomas Iron Company, Hokendauqua, Pa.; E. H. Mumford, Union Pacific Railroad, Leavenworth; Edward McIlvain, manufacturer of plate iron, Reading, Pa.; F. P. Grosvenor MacLean, United States Patent Office, Washington, D. C.; Edward Nichols, Brooks Locomotive Works, Dunkirk, N. Y.; John D. Ormrod, Donaldson Iron Company, Emaus, Pa.; Edgar Richards, chemist United States Treasury Department, Washington, D. C.; T. H. Roberts, Grand Trunk Railway, Detroit, Mich.; D. W. Robb, Amherst, Nova Scotia; T. A. Robinson, Illinois Steel Company, Joliet, Ill.; Walter S. Russell, Russell Wheel and Foundry Company, Detroit, Mich.; Newell Sanders, Chattanooga Plow Company, Chattanooga, Tenn.; T. Jackson Shaw, ship-builder, Wilmington, Del.; Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.; G. R. Stetson, superintendent Morse Twist Drill Machine Company, New Bedford, Mass.; A. A. Stevenson, Standard Steel Works, Lewistown, Pa.; H. H. Supple, editor *Mechanics*, Philadelphia; Ambrose Swasey, of Warner & Swasey, Cleveland, Ohio; J. Archie Taylor, Pusey & Jones Company, Wilmington, Del.; James A. Tilden, Hersey Meter Company, Boston, Mass.; E. A. Uehling, superintendent of blast-furnaces of Bethlehem Iron Company; F. H. Underwood, manufacturer of belting, Tolland, Conn.; Baxter D. Whitney, manufacturer of wood-working machinery, Winchendon, Mass.; W. C. Williamson, engine builder, Philadelphia, Pa.; James Wister, iron merchant, Philadelphia; Walter Wood, of W. D. Wood & Sons, manufacturers of cast-iron pipe and gas works, Philadelphia; Maunsel White, Bethlehem Iron Company, Bethlehem, Pa.; C. J. H. Woodbury, consulting engineer of the Manufacturers' Mutual Insurance Company, Boston, Mass.; Horace Wyman, manager machine works, Worcester, Mass., and H. Winfield Wyman, manufacturer of forgings, from the same city.

It will be seen that there is quite a representative body of engineers, the greater

majority of whom are members of the American Society of Mechanical Engineers, while there is a fair number of members of the American Institute of Mining Engineers. An additional number of both bodies follow on the City of New York, which, however, contains in its passenger list nearly all the members of the American Society of Civil Engineers who accepted the invitation of their English hosts.

#### Belt Strapping Machine.

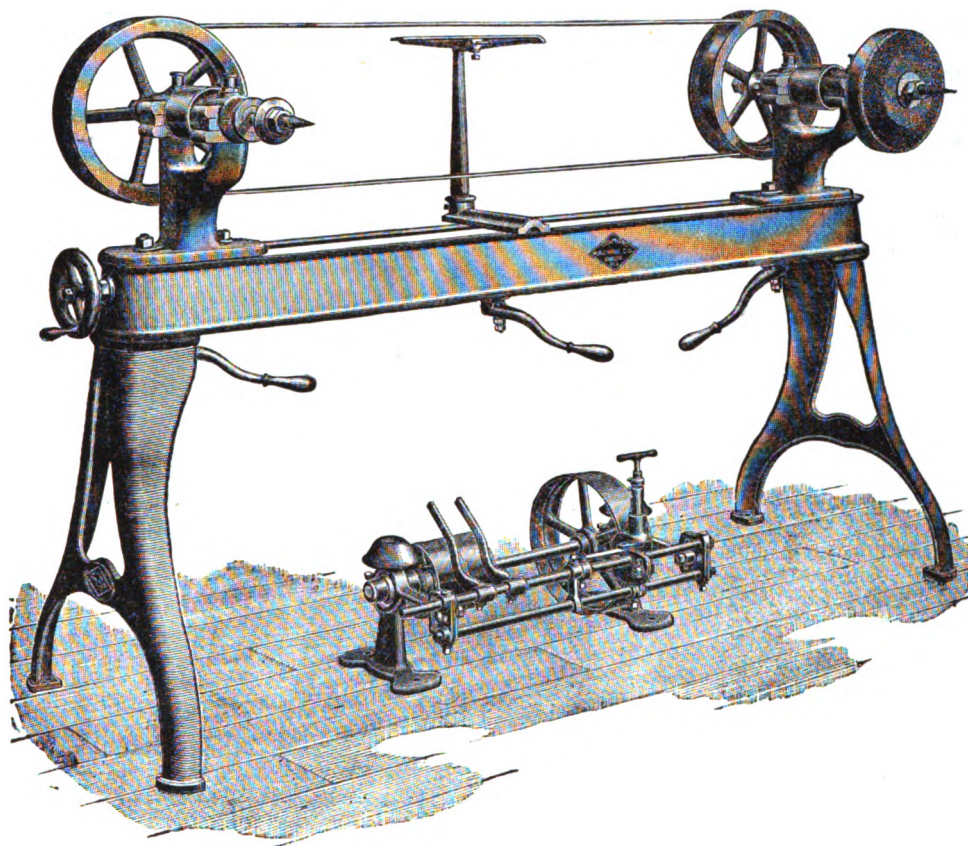
This machine is built for the purpose of running belts covered with emery, for strapping and polishing. It consists of a rigid bed, upon which are clamped two heads, each having a steel spindle carrying a driving-pulley between the bearings, and a flange-pulley close on the outside. A hand-wheel at one end of the bed

This machine is made by the Diamond Machine Company, of Providence, R. I., and Chicago, Ill.

#### Judge Thayer's Railroad Decision.

The opinion of Chicago railroad men is greatly divided on Judge Thayer's decision. Some consider it the beginning and the end of the Interstate Commerce act, or of a revolution in the existing state of affairs. Chairman Walker, of the Interstate Commerce Railway Association, and until March a member of the Interstate Commerce Commission, spoke freely on the subject. Said he: "The decision is, I think, an extremely important one. Contrary to most of the reports, Judge Thayer did not say, however, that the through rates should be the sum of the locals. On the other hand, although he does not say in so many words that there should be a

sult a state of affairs which would revolutionize business and bankrupt the Western grain-raising States. No grain could be moved from the interior to the seaboard. It is not likely that this state of affairs will come to pass, but it might. This case being a criminal one, it may be appealed from the district court where it was tried. If then the circuit court judges agree there is no further appeal. As far as regards this case, I believe it can be easily defeated. The defendant, Tazer, or, more properly, the Missouri Pacific road, was found guilty of discriminating against the Hayward Grocery Company, the shippers in both cases. The through barrel of sugar, which was shipped from Chicago, cost 34 cents per 100 from Hannibal to Hepler, and the local barrel cost 46 cents per 100 between the same places. The very fact that the shipper was one and the same in both



THE DIAMOND BELT STRAPPING MACHINE.

operates a square-thread screw for drawing one of the heads along the bed to secure the proper tension for the belt. To facilitate the changing of belts the other head is provided with a handle whereby it can be pushed quickly along the bed. Each head is clamped by a lever and cam, as shown, and a slight movement is sufficient to release or tighten it. One spindle is provided with the regular arrangement for carrying leather-covered or cloth wheels on the end opposite the flange-pulley. Two adjustable rests are furnished for different varieties of work, one being used under the lower belt, the other under the upper one. The machine is heavy, well proportioned, and arranged to run at a high rate of speed. The most important measurements are as follows: Length of bed, 6 feet; height from floor to center of spindle, 39 inches; size of flange-pulley furnished, 12 x 2½ inches; length of bearings, each, 4½ inches; diameter of spindle in bearings, 1½ inches; diameter of spindle between flanges, 1 inch; floor space, 2 x 6 feet; weight, complete, with counter-shaft, 600 pounds.

difference, he intimates that there might be by the words: 'Now, conceding that some difference between the local rate and the Missouri Pacific's proportion of the through rate is permissible under the Interstate Commerce law, owing to the different conditions affecting the two shipments, the one being a through shipment and the other a local shipment, the question I submit under the second and third counts is whether the difference shown in this case between the two rates of 12 cents per 100 pounds is, under all the circumstances of the case, a reasonable difference or an undue and unreasonable difference not justified by the circumstances under which through shipments from Chicago and local shipments from Hannibal are made.' Now, whether or not this definitely means that a difference of rates can be made, it would practically result in a jury, when called upon to figure the proper difference, deciding in favor of its own locality. In other words, this leaving of railroad rates in the hands of a jury would result in the through rate being the sum of the locals. From this would re-

cases will, I think, destroy all ground for discrimination. The act states that no greater or less rate shall be made to one person than to another person. In this case Hayward cannot be two persons."

General Freight Agent Paul Morton, of the Burlington, was a witness in the case. Said he: "We don't propose to get excited unless we see the necessity for it, and as yet I see no cause for alarm, because the decision will be reversed. It comes up on appeal before Judge Brewer, and I am confident he will not agree with the lower court. The decision is entirely against the public. If it is carried out it will end in the railroad's carrying a much smaller tonnage at a much smaller rate."

Judge Beckwith, of the Alton road, and Chairman Blanchard, of the Central Traffic Association, both agree that according to the wording of the act the through rate must be the sum of the locals.

The American square-rigged ship State of Maine arrived at this port last week in 92 days from Hong-Kong.



### The Wenstrom Magnetic Separator.\*

As the margin of profit in the manufacture of iron continues to decrease attention is called more and more to economics in every department. Beginning at the bottom, in the preparation of the ore at the mine, we notice a general tendency is toward the shipment of richer ores, securing to the mine-owner a better price per ton, which the purchaser is glad to pay by reason of the saving in freight of iron and in the cost of reduction, which depends so largely upon the amount of fuel and flux and the productive capacity of the plant. In other words, the difference in value between rich and poor ores is much greater than their relative percentages of iron indicates, because the barren material in a lean ore is not merely worthless—it is a positive source of expense, requiring transportation, handling, fluxing, smelting, and its due share of general expenses; in return for which it yields nothing and decreases the available capacity of a given plant and capital for profitable work.

The enriching of the ore is done in most places by hand picking, and in a few by wet concentration; but the managers of several magnetite mines in Sweden have been practically successful in doing it by machinery. The only magnetic separating-machine which has actually taken the place of hand picking was designed and patented by Mr. Jonas Wenström, of Örebro, Sweden.

In this machine, which is illustrated herewith, Mr. Wenström has taken advantage of the property of soft iron to become magnetized by induction. The machine consists of a barrel made up of soft iron bars and some non-conducting material (usually wood), which is rotated around a stationary shaft by means of a cog-wheel. Inside of this barrel, on the shaft, is placed eccentrically a cylindrical electro-magnet, provided with a number of flanges, Fig. 1, between which wire is wound in such a manner that the flanges are of negative and positive polarity, but energized by a current passing through the wire coils from a small dynamo. As will be seen in Fig. 1, the flanges are circular and follow the internal contour of the barrel on the front side, while on the opposite side they are cut down to the line B B', in Fig. 2. Hence the bars of the revolving barrel on the front side of the machine are magnetic only while passing from B to B'; and after they pass the point B' in the lower part of the machine they cease to be so, and remain entirely without magnetism in passing through the space from B' to B, at the back of the machine. The bars have alternately two and three projections coming close to the polar flanges, so that each bar becomes virtually a prolongation of the magnetic poles.

The ore and rock are fed on top of the revolving barrel during half a revolution, being only released after it had passed out of the magnetic field at B'; the non-magnetic material rolls off the barrel and falls in front of the dividing-board, while the magnetic material drops off behind it.

Two sizes of this separator have been introduced. The largest size treats from 6 to 7 tons per hour, and the magnetism is strong enough to support pieces of ore up to 7 pounds in weight, and separate them from the rock. The smaller size treats from 2 to 3 tons per hour of finer material, below  $\frac{1}{2}$  pound in weight of single pieces.

In Sweden these separators are used at the iron mines for extracting from old and new dumps of waste material the good ore which has been missed in the hand picking, or was too fine to be picked out in that way. They are

also applied to the ore now being mined, which in former times was selected by hand. Three of the Swedish mines use the larger size of the machine and four the smaller.

During a recent journey in Sweden (unfortunately in the winter, when the dumps were frozen and the machines idle) the writer visited five of the mines where these machines are used, and obtained the records of their working results. It is deemed sufficient to give in this paper, as a typical example, the data thus collected at the Dannemora Mine. Practice elsewhere is essentially similar, the cost varying at each mine in proportion to the handling necessarily given the ore before it comes to the separator.

The Dannemora plant consists of a separator, 24 inches on the face and 27 inches in diameter, a small dynamo and

pieces of ore which may have been mechanically knocked off by larger pieces of rock. The men's work consists of shoveling the ore into the elevator and taking the rock and ore in the cars to the dumps. The amount of material handled averages  $6\frac{1}{2}$  tons per hour.

The cost of hand picking at Dannemora previous to the introduction of this machine was 32.6 cents per ton. It now costs 9.8 cents per ton,\* and 80 per cent. more ore is obtained from the same material. Analyses of these ores are not frequently made, but it is known that the separated ore averages 59 per cent. iron for the coarse and 45 per cent. for the fine. If the fine ore can be fed by itself in a somewhat different way the results as to that part would be much better.

The separator was introduced in 1886, during which year no permanent plan,

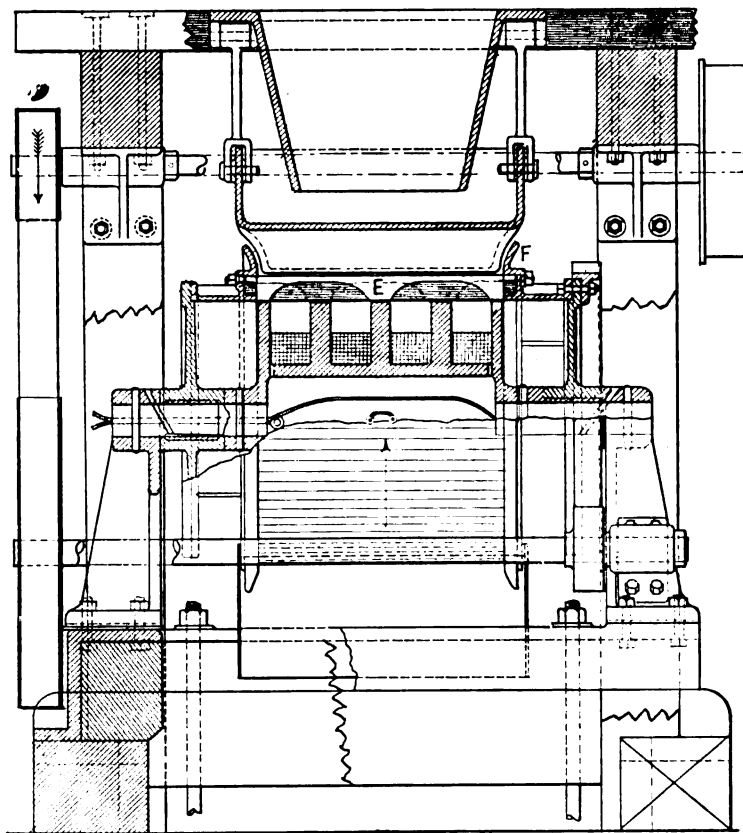


Fig. 1.—Cross Section.

### THE WENSTROM MAGNETIC ORE SEPARATOR.

a portable engine, which runs not only the separator but also a bucket-elevator and a hoist capable of raising a car loaded with  $\frac{1}{4}$  ton of ore. The material, which is anything below a 4-inch mesh, is dumped from a trestle at the elevator, which conveys the material to the feed of the separator, and the separated rock falls into a chute, and is thence delivered into a car and run off to the waste-dump. The ore runs down into a barrel-screen of perforated steel, the holes being 1 inch in diameter. The pieces which pass through fall into one car, while the coarser portion falls into another. These cars are then hoisted on the elevator and run off to the point of shipment. The fine stuff, below 1-inch mesh, is kept by itself for reasons connected with the subsequent roasting. All the ore is roasted, and there is some difficulty in roasting the fine ore. Consequently not more than 5 or 10 per cent. of the charge in the roasting-kilns is permitted to be fine. The fuel used in the kiln is the tunnel-head gas from the blast-furnace. Four laborers and an engineer are required to run the machine to its fullest capacity, with a boy to pick out from the rock any

was erected, but the machine was moved from one small waste-heap to another. The present plant was erected in 1887, and during that year, as also in 1888, the separator was run intermittently through a season of five months. The work of the three years was as follows:

Year.	Total material treated. Tons.	Ore obtained. Tons.	Percentage of total material obtained as ore.	Rock. Tons.
1886....	2,000	No data	...	2,111
1887....	5,720	3,809	63	1,911
1888....	5,169	3,923	76	1,246

Any invention adopted from a foreign country, where the plans of working, as well as the ore treated, are different from our own, must necessarily be changed to some extent to do the work required in

\* This includes interest on plant and depreciation. The cost for repairs has been nothing, and the machine shows no wear

\* A paper read by Robert Anderson Cook, A.M., of New Brunswick, N. J., at the New York meeting, February, 1889, of the American Institute of Mining Engineers.



America. Apart from this consideration, each ore must be treated in a different way. But that this invention is of practical value to us in America is demonstrated by the fact that it is used profitably in Sweden, where labor is not worth more than 50 cents per day.

There are three different cases to which this machine can be successfully applied, with only one change in the feed (namely, when the ore is below a  $\frac{1}{4}$ -inch mesh). First, where there are waste-dumps, and the run of mine has to be hand-picked. Second, where only what might be called preliminary crushing is necessary to break the greater part of the ore free from the rock—that is, by passing it through an ordinary crusher to a  $\frac{1}{4}$ -inch mesh, which ought not to cost more than 15 cents per ton. Third, where the ore must be pul-

One, which the Swedish Government settled to the satisfaction of its furnace manager, is that of the use of fine ore in the furnace. It had always been supposed to be a detriment to the furnace to charge a large proportion of fine ore. Experiments were made at the expense of the Government, under the charge of Mr. Granstrom, of Norberg, the eminent Swedish engineer, in the preparation of briquettes of a mixture of fine hematites crushed and concentrated to 85 per cent. of iron with slacked lime in a powerful brick machine. These briquettes were very nice-looking, but when put in the furnace they all went to pieces. Mr. Granstrom then resolved to see exactly how much fine ore a furnace would stand. Taking one of the charcoal furnaces in his charge, he began by using a mixture of 10 per

pieces of iron from the dirt in yards where pig-iron has been stored or from any old heaps of waste material; for instance, where the dumpings from cupolas have been piled.

One of the small Wenström machines was brought over from Sweden to this country last year, and tested with very satisfactory results on limited quantities of different ores and waste material from around steel-works. One instance in particular may be mentioned—namely, the treatment of cinder from the Bessemer converter, a material which is almost wholly thrown away at American steel-works, a small portion only being used in the blast-furnaces. A hundred pounds of this material, crushed in an ordinary Blake crusher, was run over the separator, the result being 25 pounds of magnetic material containing 70 per cent. of metallic iron. The same quantity of this waste product from another steel-works gave 38 pounds of magnetic material.

A machine was sent a short time ago to the Lackawanna Iron and Coal Company, at Scranton, Pa. At these works the waste from the cupolas and from around the runners at the converter has been for a long time treated by putting it in a "rumbler" such as is used for cleaning castings at foundries, only of a larger size. The fine pieces of slag and iron are thus broken up and fall through the rumblers, and these have always been sent to the waste-dump, while the coarser pieces are taken from the rumblers and sent to the cupola to be melted over again. At present the fine waste before it goes to the dump is put over the Wenström separator.

The following is the result of 11 days' running (from March 8 to 13, 1889), four and a half hours per day, 198½ tons of waste being put over the machine. From this quantity there was obtained 35 tons 3 cwt. of iron. Two men were added to the force at the rumblers to handle the material to and from the separator. The engineer was the same who ran the rumblers, and the steam for running the separator was obtained from the same boiler, so that the total expense was only \$2.50 per day for coal, labor and oil.

The handling of converter-cinder on a large scale has not been undertaken as yet by the Lackawanna company, the crusher required not being ready.

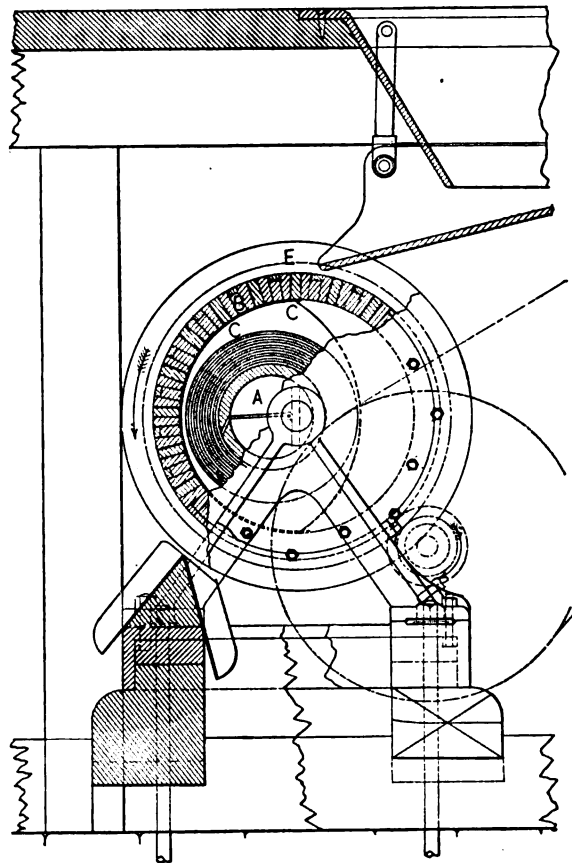


Fig. 2.—Longitudinal Section.

#### THE WENSTRÖM MAGNETIC ORE SEPARATOR.

verized by further machinery to a  $\frac{1}{4}$ -inch mesh or some smaller size.

The first two of these cases are very simple, but the third is a problem by itself, in which the cost of mining, the number of tons which must be crushed to obtain one ton of concentrate and the cost of crushing are items of far more importance financially than the mere separation of the ore from the rock. Each mine-owner must decide for himself whether it will pay. The cost of separating ore per ton of finished product by any machine it is impossible to give, since it varies with the richness of the ore. A Wenström machine requiring 1½ horse-power to run the dynamo and  $\frac{1}{4}$  horse-power or less to run the separator has a capacity of 50 tons of fine (or a larger amount of coarse) material in ten hours. The feeding should be automatic, and the ore and rock should fall by their own weight into the cars, so that there need be no hand-labor except that of feeding the crusher or screen if coarse material is to be used.

Some interesting questions arise in connection with the concentrated fine ore.

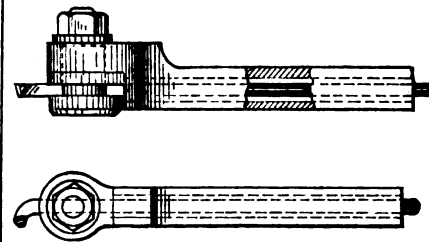
cent. fine ore and gradually worked it up to a maximum of 75 per cent. The only change he found with the latter mixture was that the gases were a little hotter, and he was able to carry a little heavier burden on the furnace. The pressure was the same, and the conclusion reached was that the manufacture of briquettes was entirely unnecessary.

Another question concerns the effect of fine concentration in reducing such impurities of the ore as enter the pig-iron made from it. This has never yet been carried so far in practice as to convert a non-Bessemer ore into a Bessemer ore by eliminating, through the process of concentration, the phosphorus contained in the gangue; but in all the concentrations of ores, wet or dry, the impurities have been materially reduced, and it seems not unreasonable to expect that many ores which are but little outside the "Bessemer limit" will be brought within that limit and thus made more valuable.

There are other uses to which this magnetic separator has been profitably applied in Sweden. One is that of separating the

#### New Tool-Holder.

A neat form of tool-holder has lately been devised, says *Engineering*, of London, by Mr. Baldwin H. Bent, B.A., Demonstrator of Mechanism and Mechanics in the University of Cambridge. It is



Bent's Tool-Holder.

illustrated in the annexed views. The tail of the cutter lies in a hollow formed in the handle of the holder. By reason of this arrangement a relatively long piece of steel may be used to form the cutter, and when it is so far reduced that the remainder has to be thrown away the piece wasted bears only a very small proportion to the part which has been used. The cutter is secured by being passed through a slot formed in the shank of a bolt just

beneath the head. When the nut of the bolt is tightened it nips the cutter between the bolt-head and a flat surface on the holder, holding it very stiffly and securely.

#### Aerated Fuel.

Manufacturers are always interested in the question of cheaper fuel, and none are more deeply concerned than the iron-workers, especially those who cannot dispose of their present valuable plant and move into the coal or natural gas regions. The subject here presented is therefore of timely interest. For nearly two years past the Aerated Fuel Company, of Springfield, Mass., have been placing their oil-burning system upon the market, and seem to have accomplished remarkable results, if we are to rely upon what some of the large manufacturers who are using their process claim for it. The accompanying engravings show the form and arrangement of a burner-cylinder and the application of this method of burning oil to a boiler and a forge. The air space, Fig. 1, is filled by a compressor which should

of general work. One cylinder containing six burners is placed on one side only, leaving one end open to receive the work. If desirable both ends may be left open, especially when it is desired to heat long pieces of iron or steel at the center. By putting an adjustable movable brick partition in the center as many burners as are not wanted can be shut out, thereby reducing the area of the fire-box, and only using one or two burners, as may be best suited to the work being done. This style of forge is in use at the repair shops of the Boston and Albany Railroad, at Springfield, and is regarded by the superintendent as being far superior to that using coal for all work requiring a high degree of heat at short notice.

The above company have many forges, muffles, ovens and similar fires, using over 1800 burners, consuming crude Lima oil burned by being atomized by governed air-pressure, and producing heat similar in quality to that of natural gas, but yielding, it is claimed, better effect upon iron, steel, brass and other metals. It can be adapted to nearly any forge now in use, but a compressor is necessary, as a blower

as the Atlanta, but will be much more formidable craft, better armed, of higher speed, and in fact representing six or seven years' advancement in naval construction. They are patterned generally upon the Medea, an English cruiser of great speed and combining many good qualities. They will be larger, however, by 100 tons and embody many improvements suggested by the working experience of the Medea. It would appear that particularly good inducements are held out to bidders for constructing them, for the designs of the Department, which are based largely upon the performance of the Medea, supplied 10,000 horse-power, which is estimated to be sufficient to drive the vessels at 20 knots speed. If this expectation is realized upon trial the contractors will receive the respectable bonus of \$200,000, or \$50,000 for each quarter knot above the 19 knots they must guarantee. The dimensions of the new cruisers will be as follows: Length, 300 feet; breadth, 42 feet; draft, 18 feet; displacement, 3100 tons; full coal capacity, 628 tons. The armament will consist of one 6-inch and ten 4-inch rapid-fire guns (the latest idea in naval arma-

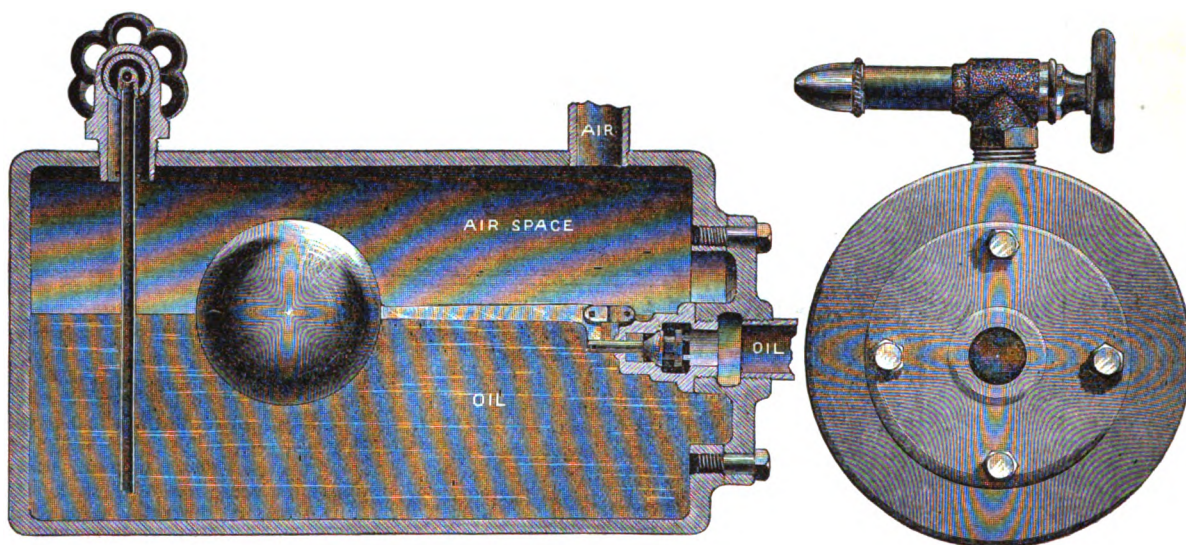


Fig. 1.—Interior and End View of a Burner Cylinder.

maintain an air-pressure of from 10 to 25 pounds per square inch, according to the kind of work being done. Although the nozzle of the burner is small—from  $\frac{1}{8}$  to  $\frac{1}{4}$ —and only a small quantity of air is used, yet it must be under an equal pressure in order that the oil may be finely atomized before igniting. The object of the float is to prevent the flowing of oil into the cylinder and rising above the mean level as established by the governing device in each cylinder. The float falls of its own weight so as to open the valve and allow the oil to rise again to the mean level. The process does not depend upon the oil flowing to the burner by gravity, and therefore the oil reservoir is placed at any convenient point below the burner, to which the oil is drawn by the current created by the escaping air. For this reason the oil ceases to flow through the burner when the air-pressure is removed and the flooding of the furnace is rendered impossible. One valve controls both the oil and air. The application of this system to the heating of boilers has met with success. The following advantages are claimed for it over coal: Uniform heat, constant pressure of steam, no ashes, clinkers, soot or smoke, and consequently clean fires; one man can attend to from 10 to 15 100 horse-power boilers.

Fig. 3 shows the system applied to a forge adapted to a large variety

will not maintain the pressure required. One important point regarding the safety of this system is the fact that although some 1800 of their burners are now in use, as stated above, in not a single instance have the insurance rates been increased.

#### Bids for More Cruisers.

The Navy Department has issued advertisements inviting proposals for the construction of two steel cruisers of 8000 tons displacement, under the authority conveyed by the Appropriation act of September last. The contractor is required to guarantee a minimum speed of 19 knots for four consecutive hours, and there is a bonus provided of \$50,000 for every additional quarter knot and a deduction of the same amount for each quarter knot deficiency. The vessels are to be completed in two years, and exclusive of the speed bonus their cost is not to exceed \$1,100,000 each. The contractors are allowed to bid for the construction of the hull and machinery according to their own designs or to accept those furnished by the Department. The proposals are to be opened August 22, and the time for the receipt of proposals for building the three 2000-ton cruisers has also been extended from August 1 to the same date.

The new vessels will be about as large

ment) and eight machine guns. The ships will be two-masted-schooner rigged, but will carry sail enough only to steady them in a sea-way. Altogether, if the vessels realize expectations they will be the fleetest and hardiest vessels in the navy.

We have been favored by E. J. Jacobus, Potter Building, New York, agent for Charles Cammell & Co., Limited, with a full account of a disastrous railroad accident which occurred at Penistone, England, some weeks since, and in which the excellent character of the Cammell steel rail was demonstrated in a very striking manner. A broken axle threw the train off the track over which it was running at a high rate of speed. The cars were badly wrecked and a number of people severely injured, one being killed. Describing the scene after the wreck, the *Sheffield Telegraph* says: "On the permanent way the effects of the accident were equally visible. The rails, made at the works close by, were branded 'Cammell's toughened steel,' 25 feet in length and 75 pounds to the yard. Yet the engine bent and twisted them like strands of wire. One massive rail was curved into the shape of the letter 'S,' and another was bent round to form a huge horseshoe. That they were 'toughened' were clear enough, for in no instance had



the force to which they were subjected caused them to snap or even to 'peel,' Messrs. Cammell & Co. should secure these rails as specimens of what they can do in rail-rolling." The axle which was the cause of the accident was made by

per cent. more than some of our competitors paid for the same work. This took place here in Pittsburgh in Amalgamated mills and has been going on for years, and there are several such mills here. I can name many such cases, differing from this

the wages question; they have abolished the advance that formerly existed in Western prices over Pittsburgh and the valleys; they have totally failed in their efforts to raise the Eastern prices to Pittsburgh rates; they have held Pittsburgh prices so high as to make the manufacture of iron here unremunerative. This is proved by the fact that some of our old and well-managed establishments have failed and their mills are now idle, and few of the others are working to advantage. Four years ago the officers of the Amalgamated Association saw what was just and necessary, and proposed and carried a reduction (but it was recalled next year), and for this they were nearly thrown overboard. The rapid and increasing use of steel makes a reduction in the rates of wages more necessary now than ever before. It is no answer to say that manufacturers show, by keeping their mills in operation, that they are able to pay the present prices; that is neither an intelligent nor an equitable way of settling the question. Manufacturers have undergone a great deal of twitting and misrepresentation in consequence of their unwillingness to undergo the heavy losses incident to a strike and stoppage of their business and its transfer to other districts not affected, and an intelligent and fair association should not require it.

I am firmly of the opinion, in which I am joined by many intelligent workmen, that the very best thing the convention of the Amalgamated Association can do for themselves and the business interests of the employers would be to calmly investigate the whole situation and propose a readjustment. By so doing they will show their capacity for appreciating the needs of business, and prevent the enlarging of the list of non-union mills.

Dynamite explosions under the direction of General Hastings, who is clearing away the *débris* at Johnstown, add new terrors for the inhabitants of that afflicted city. On Saturday chimneys and glass suffered severely, and in the evening General Manager John Fulton, of the Cambria Iron

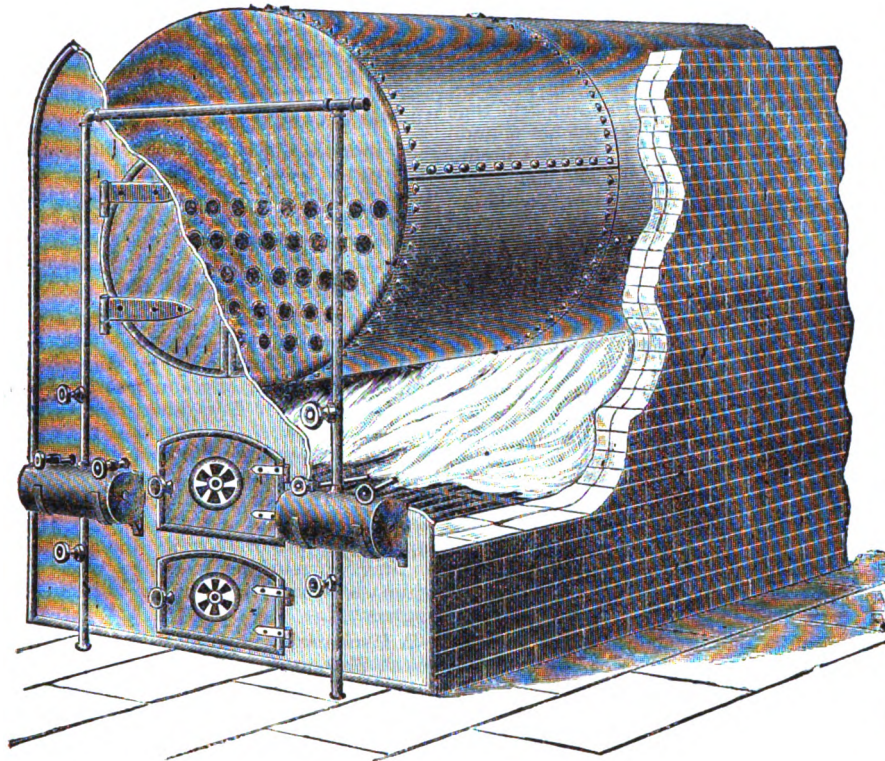


Fig. 2.—Application of the System Under a Boiler.

Vickers, Sons & Co., Limited, of Sheffield, who are regarded as very reliable manufacturers.

#### Western Prices for Puddling.

David B. Oliver, of the well-known firm of Oliver Bros. & Phillips, large iron manufacturers at Pittsburgh, recently contributed the following letter to the *Pittsburgh Dispatch*:

Anent the *Dispatch* editorial of this date headed "Leveling Them Up," referring to the action of the Amalgamated Association in establishing lodges in the Eastern mills and their efforts to bring Eastern prices up to the prices paid here, it is certainly to be hoped they may succeed. They have been engaged in these efforts for the past 12 years and so far have but little to show. Last week's *Labor Tribune* indulged in congratulations on the successful result in a strike in the mill in Danville, Pa., which ended in fixing the price for boiling at \$3.60 per ton; in Pittsburgh the price is \$5.50 per ton; both these are Amalgamated prices. All practical men I think will agree with me in saying that the facilities are better in Pittsburgh for doing this work than they are in Danville.

While the Amalgamated Association are engaged in this laudable work in the East it is to be hoped that they will not allow these outrageous discriminations to take root and grow up right here at home. It is a fact well known to many manufacturers and workmen that for several years past the scale of prices in many important respects in some Pittsburgh mills has been a dead letter, to the advantage of some employers and the disadvantage of others—their competitors who pay the prices called for by the scale. A short time since a large order was distributed among several Pittsburgh mills. Our company received a portion of it, and for the rolling of the part that we made we paid just 300

one only in degree, and I am ready to furnish the details to any one who may call on me and who may have the right to know them.

These discriminations cover a large part of the product of some of our largest mills.

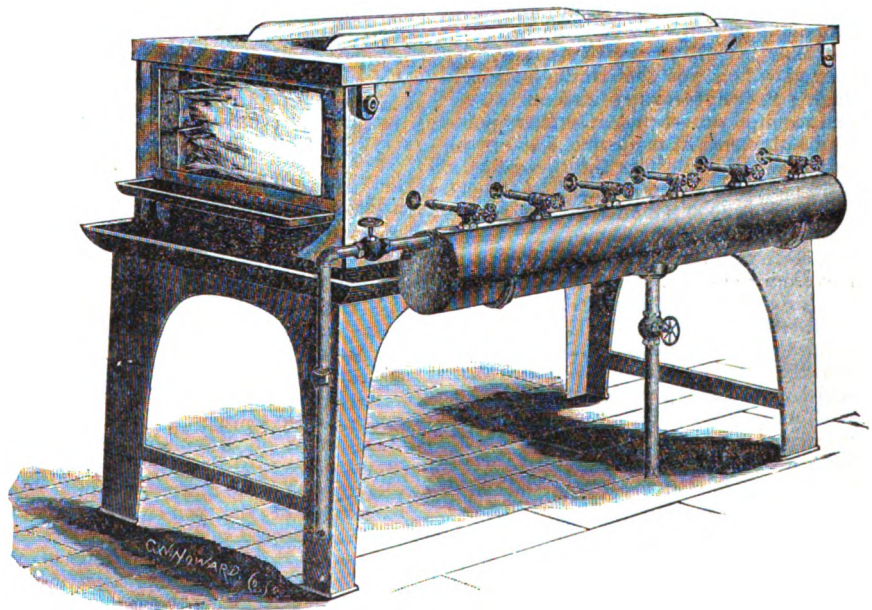


Fig. 3.—The System Applied to a Forge.

To say they are unjust is no description. They are dishonest and they must be remedied. I am not overstating the case when I say that for several years past the Amalgamated Association have been discriminating heavily and directly against the business of Pittsburgh and the Mahoning and Shenango valleys in their treatment of

Company, dictated a forcible protest to Governor Beaver, saying that the mills and offices of the company were being ruined by the blasting; that no attention had been paid to two requests for its discontinuance, and that the State would be held responsible for any further damage done.



## THE WEEK.

Mayor Grant declares his hostility to the particular form of rail commonly in use by street-cars in this city, known as the center-bearing rail, and he is determined that there shall be no delay in making a change if improvement can be enforced.

An Ottawa dispatch says: "The refusal of the Washington Government to grant bonding privileges to the Canadian Pacific Railway over their line through the State of Maine to the Atlantic sea-board is causing considerable alarm in official circles here. The Canadian Pacific claim that the refusal of the United States authorities will render useless the entire line for freight-carrying business, and will involve a loss of several millions, besides defeating the object of the line in securing a short line to the Atlantic sea-board. A cabinet minister said: 'The refusal of the American Government to grant privileges precisely the same as are now enjoyed by other Canadian lines in the United States and several American lines in Canada was most extraordinary and would not at all tend to improve the strained relations now existing between the two countries.'"

Within the last 12 months 11 American breweries have been capitalized in London at figures averaging £578,000. The *Statist* remarks quite sensibly: "The Americans are at least as enterprising and as keenly alive to the value of a good business as any Europeans, and they would hardly allow these brewery companies to come to Europe if they thought them worth the price at which they have been sold."

A trial run of the latest improved Sims-Edison electric torpedo was made at Willett's Point last week in presence of Captain Roessler and a number of officers of the regular army stationed at the Point, the improvement being an increase of speed from 10 miles an hour to from 18 to 22 miles, attained by making the lines of the hull of the float much finer and by an increase of the motor power. Heretofore the highest average rate of speed attained was 10.04 miles per hour. In a run of over 800 feet the speed made was at the rate of a fraction over 21 miles per hour, the time elapsed being 25 seconds. The current which was sent through the cable during the 800-foot run registered 900 volts and 25 amperes—equal to 30 horse-power. The 30-inch screw made about 900 revolutions per minute. The improved torpedo is 30 feet long and 20 inches in diameter and weighs 3000 pounds. It has a screw propeller and rudder, the former being at the stern and the latter on the back a few feet from the stern. The hull is supported at a submerged depth by an indestructible float, which, like the hull, is entirely of copper, and is attached to the hull by an upright steel stanchion and steel blades, which run at sharp angles, connecting the hull and float both at bow and stern, which enable it to dive under any obstructions met with when running.

It is learned that the Canadian Pacific Railway propose to establish large car works in the State of Maine at a point on their line through that State. The company hope by this means to evade the possibility of any interruption to passenger traffic by using American-built railway cars.

To prepare for the fall trade the Reading Railroad Company have given orders for 750 coal cars, of which 500 are in course of delivery.

The great "Sugar Trust" appears to be working satisfactorily to the members of that organization, despite a decision of the courts declaring its illegality. The profits are enormous and increasing. The consumption of sugar in the United States

last year was estimated at nearly 1,500,000 tons, of which 1,000,000 tons passed through the refineries controlled by the trust. The net profit to the same at 4 cent per pound—or say \$14 per ton—yielded \$14,000,000; refiners outside at the same time realizing altogether \$5,000,000 profit. The sugar brokers Willett & Hamlin, of this city, who make these calculations, say in their circular just issued that up to April 1, 1889, there was no special profit to refiners over the preceding year, but for the last two months the meltings yielded at least 4 cent per pound additional profit—"say a total net profit for the five months of \$8,280,000" for the so-called Sugar Refineries Company and \$3,410,000 for outsiders. Next to the Standard Oil concern the Sugar Trust is a success.

W. J. Coombs, of New York, head of the long-established exporting firm of Coombs, Crosby & Eddy, in addressing the National Furniture Manufacturers' Association, at their meeting in this city last week, spoke of the increasing popularity of American products in foreign markets. He said the principal reason the country had no maritime marine was that vessels could not obtain return cargoes. American manufacturers were competing in the foreign markets and driving all others out. Twenty years ago there was hardly anything going out but axes and wooden ware, and now almost everything made in the country had a good market abroad. That was due to the superior skill, intelligence and energy of the American workman. America was now doing a large trade with the English colonies and sending carriages to Africa. American goods were paid for in cash in countries where the English merchants had to give credit.

Pensacola has been chosen as the shipping point for coal from the Alabama mines to supply Cuba and the West Indian trade, which is expected to reach 400,000 tons annually. Steel barges will be employed.

The Carson Mint, in Nevada, has been reopened.

American machinery is in some respects unsurpassed. Yet we see it stated that the United Kingdom exports over \$55,000,000 worth in a single year, as compared with less than \$10,000,000 sent to other countries from the United States.

A number of prizes for technical work were awarded at the fifth annual exhibition of the Hebrew Technical School, held in this city a few days ago.

The agreement negotiated by the Commissioners to the German Conference for the settlement of affairs in Samoa was signed at Berlin by all the members of the conference on the 14th inst. As described in a Berlin dispatch the draft guarantees an autonomous administration of the islands under the joint control of Germany and America, England acting as arbitrator in the event of differences arising. The Samoans are to elect their own King and Viceroy and to be represented in a Senate composed of the principal chiefs and chambers elected by the people. Samoa is to have the right of levying duties of every kind. The agreement also stipulates that the Germans shall receive a money indemnity for their losses. A special court will be appointed to deal with the land question. The *status quo* will be maintained in Samoa until the treaty is ratified in the United States Senate.

The signing by Governor Hill of the so-called "bucket-shop bill" will have a tendency to suppress stock-gambling outside of the regular exchanges.

The Montgomery Bridge, crossing the Susquehanna River above Sunbury, Pa., was completed in a little less than four

days by 400 men under the personal direction of Vice-President Frank Thomson. It gave the Pennsylvania Railroad a route to the West without using the main line west of Harrisburg. The bridge is nearly 1000 feet in length, and the swiftness of the current made the work of construction extremely difficult.

The Nicaragua Canal Company are reported to have bought the Pallas Line of steamships for \$400,000, the new enterprise to be represented by Mr. Hall, ex-Minister to Central America.

An increase of \$34,500,000 in the capital stock of the New York, New Haven and Hartford Railroad Company will be applied, in part, to four-tracking the main line, double-tracking the Shore Line from New Haven to New London, and for exchanging with the stock of leased lines.

About 15,000,000 gallons or one-sixth of the entire daily consumption of Croton water in New York City go directly to supply the demand of manufacturers. As there were only 53 days during 1888 when the natural flow of the river was not sufficient to supply the aqueduct to its full capacity, there is liable to be no scarcity. Next year the new aqueduct will probably be ready for use, and the Sodam Dam capable of performing its functions in forming an additional storage reservoir, while the Bronx River supply will also be augmented.

A "submarine bridge" is proposed between Elsinore and Helsingborg, to be incased in a double tube, having the outerskin iron and the inner one steel, the space between the shells being filled with concrete. It is proposed submerging this bridge sufficiently to allow ships to pass over it.

Experiments in welding wire rope by the electrical process show that the strength of the finished welding is within 18 per cent. of the normal strength of the cable.

Canada will soon have an independent Atlantic cable to England, the \$2,000,000 required having been nearly all subscribed, and Honolulu merchants expect soon to have a cable to San Francisco.

The New England Water Works Association held its eighth annual convention in Fall River last week, President Hiram Nevins, of Cambridge, delivering the address. Superintendent George A. Stacy, of Marlboro, read a paper on hydrants, in which he explained the conditions which existed in his town, with the method of setting and caring for hydrants. A discussion followed, which was participated in by Superintendents W. R. Richards, of New London; Dexter Brackett, of Boston; Edward Darling, of Pawtucket; J. M. Clark, of Northampton; Charles Eglee, of New York; George E. Winslow, of Waltham; H. W. Rogers, of Salem; Chief Engineer Keating, of Halifax, and others. At the evening session Prof. J. G. Denton, of the Stevens Institute of Technology, Hoboken, N. J., addressed the association on "The Economy Attained by Modern High-Expansion Type of Pumping-Engines."

There have been fewer strikes thus far this year than there were during the same period of the previous two years. We quote from *Bradstreet's* the following statistics: "Since January 1 there have been reported 296 strikes, involving 75,110 strikers, against 389 strikes and 111,201 strikers in 1888 and 511 strikes and 212,317 strikers in five months of 1887."

The damage done at Holyoke, Mass., last week by the bursting of the canal bank is now placed as high as \$200,000, without counting the loss in wages, to the mill owners and the water-power company. Some idea of the extent of damage may be understood when it is known that there are in the city 24 paper mills with a daily



product of 200 tons, and owning 121 mill-powers, in addition to which there are 14 other manufactories, owning 71 mill-powers, all of which are either wholly or for the most part shut down on account of the break, thus throwing out of employment from 10,000 to 12,000 people, at a daily loss of at least \$15,000.

A 300,000-gallon iron tank in the oil yard of the National Storage Company, in Jersey City, was struck by lightning on Saturday afternoon and exploded with a force that blew the iron top 70 feet in the air and shook houses a mile distant.

A committee of investigation find that an explosion of malt dust originated a fire that recently occurred in Opperman's brewery, in this city. As a preventive malt mills are equipped with magnetic devices for arresting iron and steel substances before they reach the steel rollers, causing sparks. There is, however, no device which will arrest small flinty stones, and it is believed that in this case a small stone, coming in contact with the roller, caused a spark which ignited the dust, thus making an explosion.

It pays to plant willows. The examination which the Government engineer in charge of the Potomac River improvement made shows that the water reached a height of 2 feet 7 inches above the high-water mark of the freshet of 1877, which was the highest of any known or recorded freshet. The wisdom of planting willows upon the new lands has been justified. That portion of the newly-made flats upon which willows were planted was protected from washing, so that practically no damage was done there, while in the portions of the improvement which were not so protected there has been great loss.

The removal of broken stone at Flood Rock, in Hell Gate, the debris of former explosions, will be renewed at once, but will not be finished under two years. Colonel Gillespie, who has direction of the work, will seek authority for removing other obstructions from the river which are equally dangerous, notably Diamond Reef, between the Battery and Brooklyn, a reef off Thirty-third street, East River, also the obstruction known as the Middle Ground, and which lies just beyond Ward's Island, in mid-channel, over which there is a draft of but 12 feet at low water.

Governor Beaver, of Pennsylvania, announced that he had abandoned the plan of taking money from the State Treasury for the relief of Johnstown, and that he had accepted the offer made by officers of Philadelphia banks to advance him \$1,000,000, without interest, and without security other than the Governor's promise to endeavor to have the Legislature make an appropriation to repay the loan.

The amount of water passing over Niagara Falls varies with the height of the river. Prof. W. D. Gunning estimates the average amount at 18,000,000 cubic feet per minute. Allowing 62½ pounds to the cubic foot, this would give a total of 562,500 tons per minute, or 25,312,500 tons in 45 minutes, of which somewhat more than two-thirds passes over the Horseshoe Falls. Other estimates place the total amount passing over both falls as high as 100,000,000 tons per hour. In comparison, the flood at Johnstown was a gill.

The Minnesota Iron Company, at their meeting at Duluth, after reporting a surplus for this year's business amounting to \$1,800,000, decided to put it into a line of ships for the ore trade, to be built at once. The sum of money to be expended would build about 80 300-ton vessels; but there will be several large and costly steamships of the most approved lake

models, none of them to be less than 3000 tons capacity and fast travelers. They will probably be fitted with triple compound engines of not less than 1200 horse-power. The Minnesota Iron Company are shipping this season, together with their associate mine, Chandler, nearly 80,000 tons a week. The vessels to be built will be capable of carrying considerably over 100,000 tons a month, thus enabling the company to handle nearly all their present output of ore.

The Chesapeake and Ohio Canal stockholders have resolved to repair the damage by the flood as soon as possible. About \$300,000 will be the cost of the work.

The Institution of Civil Engineers gave a reception on the 14th inst. at London in honor of the visiting American engineers. President Goode warmly welcomed the guests, and said that their influence had been one of the principal factors in raising the United States to the place of one of the foremost nations of the earth. Professor Thurston, in behalf of the visitors, returned the heartiest thanks for the cordiality with which they were received.

A floating workshop, to be known as the steel torpedo-depot ship Vulcan, was launched at Portsmouth, England, last week. It is intended that she shall accompany a fleet and carry a large equipment of torpedo-boats. She will be supplied with hydraulic cranes on which torpedo-boats can be twisted in and out of the water. The Vulcan is of 6620 tons burden and 12,000 horse-power.

Senator Cullom says he has already made up his mind with reference to railway management that ultimately Canada and the United States will have to inaugurate an arrangement corresponding to the present Interstate law. "So far in the investigation," he said, "the Canadian officials all affirm that the present law hurts them, and those in this country are positive that Canada profits most by the measure. The argument of our managers was that where the Canadian roads lost on the long hauls extending into this country they recouped on local rates in Canada, while with roads wholly under the operation of the Interstate law this was impossible."

Engineer Burke, of the British man-of-war Calliope, the only vessel that escaped from Apia harbor during the great storm there, has been promoted to be fleet engineer as a reward for his services in enabling the vessel to steam out of the harbor.

The Union Trust Company will erect an 11-story brick and granite front office building at Nos. 78 to 82 Broadway and Nos. 3 to 7 New street. It will have a frontage of 72 feet, will run back 106 feet and will cost \$800,000.

Experiments recently made in electric-subway ventilation in this city have been eminently satisfactory. A large blower has been placed in the basement of the Hotel Metropole, at Forty-second street and Broadway, and connections made with the subways. A constant current of air is sent down along the line, and at Fourteenth street a pipe runs out of the man-hole to the roof of one of the houses. Mr. Kearney, the engineer, says that the system will be applied in other places and that all danger of man-hole explosions is now over.

Farming lands in New York State are depreciating. The assessors in 14 counties visited found that farming lands had depreciated in value while city property had increased in value. State Assessor Wood is of the opinion that in a few years there will be nothing much but tenant farmers in this State. The same facts are observed in Pennsylvania.

## MANUFACTURING.

### Iron and Steel.

The Riverside Iron Works, of Wheeling, W. Va., booked an order last week from the Standard Oil Company for 27 miles of steel pipe. The concern are enjoying an excellent demand for this article at present.

The following is the report of Fayette Brown, receiver of Brown, Bonnell & Co., of Youngstown, for April, 1889: Balance on hand, April 1, \$6,729.98; receipts in April, \$228,720.81; total, \$235,450.24; disbursements in April, \$229,722.98; balance on hand April 30, \$5,727.81.

McClure & Schuler, engineers and contractors, of Pittsburgh, who have the contract for the erection of three hot-blast stoves of the Massick & Crookes design, for the blast-furnace of the Bellaire Nail Works, at Bellaire, Ohio, are pushing the work forward to completion as rapidly as possible. When completed the stoves will add considerably to the productive capacity of the furnace.

A press dispatch from Newcastle, Pa., under date of the 13th inst., says: Samuel S. Brown, William Henry Brown, Lizzie B. Ward and James Ward have begun proceedings in the court of Lawrence County against James M. Schoonmaker and Hugh Burgwin, executors of Alice B. Schoonmaker, deceased, for partition of the real estate situated in this county of the late William H. Brown. The property is known as the Shenango Iron Works property, on which is located Oliver Bros.' Rosena Furnace, and other real estate in this city, and 45 acres of coal lands in Shenango Township. The property is valued at \$100,000 and the greater portion of it has been lying idle for years. It was lately owned by the old firm of Reis, Brown & Berger. The Alice B. Schoonmaker mentioned above was a daughter of William H. Brown, and the property is tied up in such a shape that nothing can be done with it.

Singer, Nimick & Co., Limited, steel manufacturers at Pittsburgh, are putting in a Boulton apparatus for making steel ingots, manufactured by the Solid Ingot Company of Newark, N. J.

The Keystone Bridge Company, of Pittsburgh, report bridge-building as unusually brisk this year. They have orders for 10,000 tons of work in hand, which will keep the plant busy until next fall. Altogether the works will turn out 17,000 tons of structural iron this year, which is 2000 tons more than ever before in the same time.

On Monday, the 10th inst., the mud-drum in a boiler in the sheet-iron department of the Mahoning Valley Iron Company's Works, at Youngstown, Ohio, gave way, causing the boiler to explode and wrecking four other boilers in the battery. One man was killed and several others were severely injured.

At a recent meeting of the stockholders of the Glasgow Iron Company, of Pottstown, Pa., it was voted to increase the capital stock of the concern from \$300,000 to \$500,000. Of a total of 8000 shares 2765 were voted unanimously for the increase.

The sale of the property of the Newport Iron and Steel Company, at Newport, Ky., which took place a few weeks ago, has been confirmed by the Chancery Court. The plant is now owned by the sureties on Mr. Shriver's bond. It is not probable that the works will be started again very soon.

Under date of the 15th inst., Alex. Laughlin & Co., engineers and contractors, of Cleveland, Ohio, issued the following

announcement to the trade: "We beg to advise you that on June 18 we sold our patents, drawings and such good-will as we may enjoy to Alex. Laughlin Company, Incorporated, who assumed entire charge of our business on that date, and will conduct it in the future, the primary object of this change being to better equip ourselves to handle our constantly increasing business, and at the same time the new company will take up some features in a field for fuel economy, to which heretofore but little attention has been paid by gas engineers. We take pleasure in assuring you that the above-mentioned change will in no way alter our business methods, as the officers of the new company will be selected from our late firm, and the new owners of our patents propose pursuing the same policy as have we. That is, they will guarantee to demonstrate a fixed economy from all plants erected by them before they ask final payment for the same."

The Attalla (charcoal) Furnace, at Attalla, Ala., went into blast on the 15th inst. under very favorable circumstances, as stated by the following private letter from a representative of the company to a friend in Chicago: "You need not hesitate to guarantee our iron as good as any made in the South. . . . More than a dozen different parties who have seen the brown ore in our stock-house say we are very particular, and our furnace man claims that it is a very superior article. We are taking every possible pains with the stock, and I am quite sure I have never seen cleaner and better-looking ore. . . . When we ship a car you need not have any fears about it not being first-class. The heavy rains delayed us and we now expect to light the furnace on Saturday, but it will take some days to get down to work. . . . We want to sell some iron, but must have the top of the market. Not willing to cut prices." This is a new furnace with a capacity of about 60 tons per day. From another source we learn that it started off well for a new furnace, being up to 45 tons, making car-wheel iron. It has been conjectured that the blowing-in of this plant would materially affect the price of Southern car-wheel iron in the Chicago market, but if the Attalla Furnace Company adhere to the policy above quoted buyers may be disappointed in their expectations of a break. Messrs. Rogers, Brown & Co., Cincinnati and Chicago, are the sales agents for the West and Northwest.

The large new plant of the Kellogg Seamless Tube and Mfg. Company, in Findlay, Ohio, has gone into operation with a large force making seamless tubes, and the test of the machinery is claimed to be a grand success. So well are the company satisfied that an increase in their capacity has already been ordered. Hon. Howes Norris, of Boston, Hon. Benjamin Butterworth and Powell Crosby, of Cincinnati, are leading stockholders in the concern.

The first blast-furnace put in operation since the flood by the Cambria Iron Company, of Johnstown, Pa., was fired up on the 12th inst. The furnace was No. 5, and one of those least damaged by the flood. Superintendent Price has made the following statement relating to the starting up of the balance of the plant: "We will be working full in the steel works, blooming-mill, No. 2 rail-mill, the 9-inch mill and merchant-mill by July 1, sure. Some departments will be in operation before that time, but we will not begin to roll iron and steel until then. One of the six furnaces has already been put in blast, and the others will be put in as soon as we can get them repaired. A number of the shapes formerly made at the Gautier works will be made in this

mill until they start up. In less than one month or six weeks at the most the entire plant will be in operation."

A press dispatch from Johnstown, Pa., under date of the 10th inst., says: "The Johnstown Switch Company, whose works were entirely swept away from Woodvale, on the Conemaugh River, are making preparations to rebuild their switch works plant on an extended scale at Moxham, three miles up the Stony Creek, and entirely away from any possibility of any recurrence of the disaster which has overtaken their works here. They employ from 1000 to 1200 men."

J. & J. B. Milholland, of Pittsburgh, manufacturers of engines, machinery and haulage plants for mines, have recently put into successful operation a plant for a coal mine upon the direct-action principle. This is the first plant of the kind built by this firm, although they have put down 75 geared plants, and its operation has been so successful in this instance that they are convinced it is superior to the geared plant, as it runs more smoothly, diminishes the wear and is simpler in construction. The plant was built for the Redstone Coke Works, at Uniontown, Pa. The cars are hauled up a slope  $1\frac{1}{2}$  miles in length, the grade being 20 feet to the hundred. The engines are 18 x 40 inches, connected at right angles to the shaft that carries the winding-drum. This drum is 4 feet 6 inches in diameter and holds  $1\frac{1}{2}$  miles of  $\frac{1}{2}$ -inch steel rope. It is provided with a double friction operated in the usual manner. The bed-plate to which the cylinders are bolted is 18 inches in height; in fact, all parts of the machinery are heavy and substantial, as is required in this class of work. The steam distribution is by the ordinary link motion, to provide for moving in both directions.

The large sheet-mill of the Brooke Iron Company, Birdsboro, Pa., in which there was a strike for a month past, resumed work on the 10th inst., all differences having been adjusted. The company's nail factory, which depended on the sheet-mill for its iron, was enabled to resume.

The rail mill of the Allegheny Bessemer Steel Co., at Duquesne, Pa., is in full operation with non-union men, and it may now be regarded as a non-union mill. The contest was whether the mill was to be union or non-union, and the company have won. The hitch was not so much in regard to wages; the company wanted to be independent of labor organizations, and they have been successful. In addition to the mill in question the Solar Iron Works, Black Diamond Steel Works and the steel works of Singer, Nimick & Co. are being operated by non-union men, and are therefore denominated non-union mills.

Under date of the 15th inst. M. V. Smith, metallurgical engineer, of Pittsburgh, issued the following announcement to the trade: "The following figures show the amount of coal used to heat a ton of iron or steel for seven consecutive months with seven Smith gas-producers and six solid-hearth regenerative gas furnaces at the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa.:

	To gross ton finished product.
November, 1888.....	346 pounds coal.
December, 1888.....	324 pounds coal.
January, 1889.....	310 pounds coal.
February, 1889.....	392 pounds coal.
March, 1889.....	371 pounds coal.
April, 1889.....	343 pounds coal.
May, 1889.....	286 pounds coal.

Gas-makers' wages average 6 cents per ton finished product. The first three of these furnaces were built under the supervision of an engineer, and were of the following dimensions: One furnace working-hearth 7 x 14 feet in the clear; two fur-

naces each having working-hearth 7 x 21 feet in the clear. The last three of these furnaces were built under contract as follows: One furnace with working-hearth 7 x 18 feet in the clear, \$8350; two furnaces with working-hearth 7 x 14 feet in the clear, \$5570, making a total for the three furnaces of \$8920, including gas-producers and connections complete ready for work. Later developments with my system in connection with boilers indicate that a proportional economy may be obtained in generating steam, and I am prepared to contract under a guarantee that the amount of coal per ton of iron for steam and heating shall not exceed  $\frac{1}{4}$  ton to the ton of 2240 pounds finished product."

#### Machinery.

The American Nail Machine Company, of Findlay, Ohio, are engaged in the erection of a high-speed engine of an entirely new design. Patterns are complete and engines built of several sizes, with still more now under way, the full set being 2 to 150 horse-power, the special features being minimum of space, immense speed and direct power, durability and economy of fuel.

The blowing-engine now under construction for the Shenandoah Furnace Company, of Milnes, Va., by William Tod & Co., of Youngstown, Ohio, has positive valve-gear and round steel and brass air-valves faced with leather and closed with springs. The arrangement of the air-valves is such that the total clearance in the blowing-tube is less than 2 per cent. of the cylinder displacement. The above firm have just shipped one of their Porter-Hamilton engines to Carnegie Bros. & Co., Limited, at Pittsburgh, and are building another for the Lake Erie Iron Company, of Cleveland, Ohio.

The Wilson-Snyder Mfg. Company, of Pittsburgh, recently built two pumping-engines for the water-works at Allegheny City, Pa., that have a combined capacity of 85,000,000 gallons of water per day.

The Bucyrus Foundry and Machine Company, of Bucyrus, Ohio, have been established the past eight years, and have steadily increased their business, so that at the present time they are employing 150 hands. Their specialties are steam-dredges and steam-shovels. The products of this company are shipped all over the Union. They also have a good foreign trade. This year's trade shows a slight increase over last year's, and the company report the prospects for this season very good. The officers are: Col. W. H. Harris, president; Howard B. Hills, vice-president and treasurer; W. B. Crittenden, manager; A. B. Stetson, superintendent; A. W. Robinson, assistant superintendent.

The Leechburg Foundry and Machine Company, of Pittsburgh, report that they have plenty of business on hand. Among large orders recently received was one from the Rolled Steel Carriage Wheel Company, of Pittsburgh, for one 6-inch roll train, one 16-inch roll train and other special machinery; also a large roll order was received from the Cohoes Rolling Mill Company, of Cohoes, N. Y.

The American Nail Machine and Mfg. Company, formerly of Ashtabula, Ohio, have lately moved into their new and commodious plant at Findlay, Ohio. The buildings of this company are all built of stone; dimensions of the main building, 290 x 50; foundry, 50 x 80. This company manufacture the well-known American nail-machine and the American high-speed engine. This engine is especially adapted for electric-power plants, where high speed and power are a necessity. This company have splendid shipping facilities, being connected with switches to three different railroads. The officers of

the company are as follows: P. F. Good, president; John A. Scott, vice-president; A. W. Call, secretary.

Main Belting Company, of Philadelphia, finding that their business had outgrown their facilities, purchased a property on Carpenter street, and have just completed a new four-story building 180 x 50, which besides being in a central location has all the necessary improvements for meeting the steadily-increasing demand for their belting. Their trade extends to every State in the Union, from which it may be inferred that they turn out an article having great merit.

The Thomson-Houston Electric Company report the following sales: Narragansett Pier, R. I., 80 arc, 1000 incandescent; Seattle, Wash. Ter., 50 arc; Brockport, N. Y., 20 arc; Troy, Ohio, 50 arc; Somerville, Mass., 100 arc; Binghams, N. Y., 150 arc; Philadelphia, Pa., 100 arc; Lowell, Mass., 50 arc; Boston, Mass., 1000 alternating; Springfield, Mass., 90 arc; Minneapolis, Minn., 150 arc, 1200 incandescent; Rochester, N. H., 50 arc; Chelsea, Mass., 100 arc; Norwich, Conn., 400 incandescent; Goldsboro, N. J., 45 arc, 600 incandescent; Sorrento, Maine, 80 arc. Also the following isolated plants: Wamsutta Mills, New Bedford, Mass., 400 incandescent; Bennett Mfg. Company, New Bedford, Mass., 600 incandescent; Whittle & Hanrahan, Providence, R. I., 15 arc; H. Ricker & Sons, Poland Springs, Maine, 12 arc; Jewell Milling Company, Brooklyn, N. Y., 300 incandescent; M. W. Hyer, New York, 50 incandescent; Lawrence Line Company, Lawrence, Mass., 50 incandescent; Riverside Mills, Providence, R. I., 25 incandescent.

Ludlow - Saylor Wire Company, St. Louis, Mo., are running full in all their departments. They have just secured the contract for all the ornamental brass and nickel-plated work to be used in the new restaurant now in course of erection corner Broadway and Elm street, St. Louis.

Hall & Barr, of Cedartown, Ga., would like to correspond with manufacturers of cotton-elevating machinery.

W. Kyle, of Mitchell, Ont., wishes information regarding manufacturers of binder-twine machinery.

The Champion Blower & Forge Company, of Lancaster, Pa., have just issued a fully-illustrated catalogue showing the many styles of blowers manufactured by them. The catalogue also describes their exhaust fans, portable forges, pulleys and hangers, tire benders and shrinkers, drill presses, tuyere irons, &c. The apparatus described covers all the machinery used in the forge shop, and includes the improvements and new devices introduced by the above company.

Lodge, Davis & Co., the well-known manufacturers of machinery, have purchased the entire plant of the Cincinnati Corrugating Iron Company, which they will equip with improved machinery for the manufacture of their engine lathes, iron-planers, shapers, upright drills, &c. This will give them a plant about double the size of their present one, which has for some time back been unable to keep abreast of the demand.

#### Miscellaneous.

The Canton Steel Roofing Company, Canton, Ohio, say their orders for the first week of June amounted to nearly 8000 squares. They are putting on a 700-square roof for the Bellaire Goblet Works, Findlay, Ohio, and one of 500 squares for Deere & Co., of Moline, Ill., the large plow manufacturers.

The Giant Compound Mfg. Company, of Keyport, N. J., are manufacturing what they term Ground Crystals for hardening and toughening cast-steel tools, as well as

dies, taps, reamers, &c. They claim that Bessemer steel can be readily hardened with these crystals. They also manufacture the Giant Welding and Hardening Compound for welding cast-steel at separate heats, for hardening cold-chisels and other tools and for restoring burnt steel. They issue a circular giving a large number of testimonials from well-known iron and steel workers relative to the merits of these compounds, the manufacture of which is covered by letters patent.

The plant of the Lafayette Car Works, at Lima, Ohio, was closed down on the 11th inst. on account of a lack of orders. Three hundred men were thrown out of employment.

Evans & Howard, of 916 Market street, St. Louis, Mo., manufacturers of fire-brick gas retorts, St. Louis standard sewer-pipe and fire-clay goods in general, have just issued a catalogue in which they invite particular attention to the illustrations of 9-inch brick, cupola blocks, tiles and shapes, particularly blocks for retort settings, a large portion of which work is on special orders, and as various in kind as irregular and difficult.

#### PERSONAL.

Thomas Bray, superintendent of the tube department of the Riverside Iron Works, at Wheeling, W. Va., has resigned his position to accept a similar one with the Warren Tube Company, at Warren, Ohio. Mr. Boyd, formerly his assistant, has been promoted to the superintendency.

Irving M. Scott, manager of the Union Iron Works, in San Francisco, was given a hearty reception by his employees on his return from Washington. The men thanked him for his efforts in securing contracts for the new cruisers. Mr. Scott in reply dwelt on California's great resources for manufacturing, and declared that only brains and enterprise were needed to develop them.

The President has made the following consular appointments: Wakefield G. Frye, of Maine, at Halifax; Joseph A. Leonard, of Minnesota, at Shanghai; Zachary T. Sweeney, of Indiana, at Constantinople; Oliver H. Dockery, of North Carolina, at Rio Janeiro; Oliver H. Simons, of Colorado, at St. Petersburg; George W. Roosevelt, of Pennsylvania, at Brussels; Levi W. Brown, of Ohio, at Glasgow.

W. P. Thompson, of the Standard Oil Company, was elected president of the National Lead Trust Company, Henry Hertz, the first president, resigning.

Through the courtesy of P. M. Schwab, superintendent of the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa., a number of the visiting delegates to the convention of the Amalgamated Association of Iron and Steel Workers, in session at Pittsburgh last week, made a tour of the plant on the evening of the 12th inst. They expressed themselves as being delighted and surprised at the machinery and modern appliances in vogue at the works, and the skill required to operate them.

There is to be a convention in Hartford, Conn., on the 25th inst., continuing four days, of Chiefs and Commissioners of Labor Statistics. President Carroll D. Wright is hopeful that this gathering will be productive of great benefits. A liberal interchange of views is asked of each member.

W. Seward Webb, President of the Wagner Palace Car Company, started from New York to Vancouver by way of the Northern Pacific Railroad, and in about six weeks traveled 20,000 miles in a

special train. Only in the United States, with its wide domain and far extended lines of track, is such an exploit possible.

Andrew Carnegie is in London and gave a dinner to Mr. Gladstone and Mrs. Gladstone at the Hotel Metropole on the 18th, at which a number of distinguished guests were present, including Minister Lincoln, our representative at the English Court.

The announcement of the marriage of John A. Roebling, son of Washington A. Roebling and grandson of John A. Roebling, the great Brooklyn Bridge engineers, the *New York Press* says, recalls to the public mind the life and service of one of America's most gifted sons. Probably to William C. Kingsley and Henry A. Murphy the credit of the great enterprise known as the Brooklyn Bridge, connecting New York and the City of Churches, was in chief due. It would be absurd in these days to say that without Mr. Roebling the Brooklyn Bridge would never have been built, but it is simple justice to record the fact that he built it, and that without his unsurpassable ingenuity the plans of the bridge would have been delayed for many years. He was fortunate in having as his chief assistant and successor his gifted son, Washington, into whose hands came the literal work of building and of carrying out the plans prepared by the elder Roebling and himself.

The new General Appraiser of Merchandise at New York is Donald McLean, a well-known lawyer of this city, recommended by the two New York Senators and others. He is a graduate of Columbia College, and was elected an Alderman from the "brown-stone" district. He is a brother of Col. H. C. McLean, Assistant Architect of the Treasury.

Charles A. Ashburner, the well-known Pittsburgh geologist, had the honorary degree of Doctor of Science conferred upon him at the recent commencement of the University of Pennsylvania, held in Philadelphia, as an acknowledgement of the scientific value and merit of his surveys and reports for the Geological Survey of Pennsylvania. This is a high honor in recognition of individual distinction. Doctor Ashburner graduated from the University of Pennsylvania about 15 years ago with the highest rank in his class, and immediately entered the corps of the United States Light-House Service Survey. Upon the organization of the Pennsylvania Geological Survey he resigned from the Government work and was appointed assistant of Professor Lesley, State Geologist, with whom he has been associated ever since. About two years ago he gave up much of his active State work and went to Pittsburgh to assume connection with Mr. Westinghouse in his extensive mining interests, particularly in the mining of natural gas, latterly, however, making extensive geological and mining examinations in the Rocky Mountains and Pacific Slope.

William Taylor, a prominent citizen of Brooklyn, died on Monday night at his home, age 78. For 33 years Mr. Taylor was connected with the Columbia Iron Works, of which he was the head. He came to this country when 14 years old, from Manchester, England. Mr. Taylor never held any official position excepting that of Bridge Trustee.

Captain Zalinski, inventor of the dynamite-gun, was among the Americans presented at the Court of St. James at the Queen's last levee.

Desolation reigns at Panama, where merchandise and all sorts of personal effects are sold for what they will fetch.

# The Iron Age

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DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
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GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## Iron-Ore Supplies.

The thoughtful reader cannot fail to be impressed by the peculiar difference between two valuable papers on the subject of iron-ore supplies which have made their appearance this year. One treats of the subject from an American stand-point, with reference to the sources from which the blast-furnaces of the United States receive their supply, and was prepared by John Birkinbine, of Philadelphia, for the February meeting of the American Institute of Mining Engineers. The other paper is of English origin and formed the official address of President J. T. Smith at the May meeting of the British Iron Trade Association. It treated of the sources of ore supply for the blast-furnaces of Great Britain. Notwithstanding the huge annual output of pig-iron in the United States, which now falls but little short of that of the mother country, the paper of our American author deals very largely with domestic sources of the supply of iron ore and pays but little attention to foreign sources, as imported ores constitute but a small part of the great quantity required to keep our furnaces running. On the other hand, the British author devotes much space to the consideration of the iron-ore deposits of foreign countries and but little to those of his own, in recognition of the fact that British furnaces depend to a very important degree on foreign iron ore, particularly for steel-making. Mr. Smith says that as this description of ore is not found at home in quantities sufficient for steel-makers' requirements, "the sources of external supply become not only an important but a pressing question." Hence his inquiry into the subject, with the view of demonstrating to his fellow-members of the association that they need have no fears of the early exhaustion of the supply. Our American author writes in a justifiable spirit of exultation over the magnificent mineral riches of his country, without a thought as to the possibilities of the future save in the light of still greater development. His British co-laborer writes as one having some anxiety for the future and desiring to allay apprehension.

Mr. Birkinbine's paper states that the estimated product of iron ore in 1888 throughout the world was, in round numbers, 50,000,000 gross tons, of which the United States produced about one-fourth, its output being practically equal to that of Spain, France, Russia, Austria and Hungary combined. We produced last year nearly twice as much iron ore as Spain with all its exports. Great Britain leads this country in ore production by about 15 per cent., but the average richness of its ores in metallic iron is far below that of ours; in other words, if we mined and consumed ores as lean as those used in British blast-furnaces generally, we

would be obliged to raise very much more ore than we do in proportion to the pig-iron smelted. The richest ore used in Great Britain is taken there from other countries. The dependence of British iron manufacturers upon outside sources of iron-ore supply is shown by the rapid increase in importations. In 1868 about 114,000 tons were imported from Spain and Norway for use in steel-making. With the growing requirements for the Bessemer process the importations increased, although up to 1877 the quantity brought in annually did not exceed 1,000,000 tons. But in 1880 the British importations jumped suddenly over 1,500,000 tons, amounting in that year to 2,634,000 tons. This remarkable increase happened concurrently with the development of the basic process, which would naturally have been expected to check importations by rendering a very large part of the domestic output of ore available for steel-making. But the consumption of ore by the acid process continued to increase, and foreign Bessemer ores were required in large quantities from year to year, until in 1887 no less than 3,762,000 tons were imported. This is slightly in excess of the entire output of our Lake Superior iron ore mines in 1886, the comparison showing the magnitude of the British demand on foreign sources of ore supply.

Mr. Smith shows in his paper that the iron-ore resources of Spain and Sweden are equal to any demand which may be made upon them by Great Britain for a very considerable period, but he also reveals another fact of striking significance in the same connection—namely, that the cost of such ores laid down at British works will be enhanced by the early exhaustion of mines lying near the sea-board. Transportation charges have hitherto been very light on Spanish ores destined for Great Britain, but British manufacturers will ere long be somewhat handicapped in this respect. Their competitors in other countries will hardly mourn over the possible effects of the changes which this may bring. Referring to this country, Mr. Smith says: "The United States have so large a territory, transportation over long distances is so cheap, and there is such a constant tendency to move the centers of industrial gravity westward or southward, that the only thing that is certain about the future of the American iron industry is its uncertainty." He might have added, however, that the very great progress thus far made in this country, both in building up an iron industry and in developing vast deposits of good ores, presages a still more brilliant future with its superstructure resting on the solid foundation of an abundant home supply of the essential raw materials.

The *American Architect* for June 15 contains quite an interesting article on the nature and uses of iron and steel, by Louis De Coppet Berg. In the main the statements made are correct, but a few of the inaccuracies are most glaring. It would be inferred from one of the principles laid down for the manufacture of pig-iron that all iron ore is "broken in the stamping-mill and washed in streams, and then roasted or calcined in kilns to remove the moisture and carbonic acid." This bit of news will be highly appreciated by our furnace men. The author further says:

"There is a very strong and tough charcoal iron from South Carolina, but it is used mainly for car-wheels, being too expensive for ordinary work." We presume it must be very expensive, if there is any South Carolina pig-iron in the market, as the last made in that State, to our knowledge, was turned out in the early sixties. The manufacture of iron in any form in South Carolina has long been an extinct industry.

## Diverting Trade Channels.

American citizens since the year 1864 have not been permitted the use of canals in Canada on equal terms with inhabitants of the Dominion, and this regardless of treaty stipulations. It is generally believed at Ottawa that the recent order of the United States Treasury refusing to allow the transport in bond of goods passing from one Canadian port to another over the newly-constructed short-line railway through the State of Maine is one of the results of this unfair discrimination against citizens of the United States. In building this road the Canadian Pacific fully expected to divert to that line the trade which, in coming from the Atlantic sea-board, enters Canada through American channels, but if the recent order is persisted in this object will be entirely thwarted. With reference to discrimination against American shippers, a report from the Government at Ottawa, just published, shows unmistakably that, despite the efforts of the Dominion Government to prevent it, shipments of grain through United States channels have increased 260 per cent. during the past nine years, while through Canadian channels they have declined 52 per cent. This appears from the following statement of cereals—wheat, corn, peas, barley and rye (upon which articles the refund is given)—passing through the Canadian canals since 1880, discriminating between those passing from one United States port to another United States port (upon which full toll was collected) and those passing directly through to Montreal, subject to a rebate of 18 cents per ton:

Years.	From U. S. ports to U. S. ports, no refund. Tons.	From Lake Erie thro' to Montreal, refund. Tons.
1880	47,029	383,800
1881	64,251	144,127
1882	63,861	180,664
1883	121,876	186,814
1884	104,537	142,194
1885	117,346	96,569
1886	151,551	208,940
1887	134,863	185,034
1888	169,664	160,368

Other tabulations of statistics relating to the traffic of the Welland Canal and to the freight movement from Lake Erie via Montreal enforced the same truth respecting the futility of efforts to divert United States traffic from its natural channels. These statements, if they cannot be refuted, possess a deep significance to English investors and others who have put their millions of pounds sterling into Canadian public works, and they point, furthermore, to the expediency of arriving at a fair mutual adjustment of outstanding differences between the two Governments, rather than a persistence in measures that embarrass and exasperate without serving any practical end.



### The Law of Industrial Conspiracy.

An interesting article in a recent issue of the *Political Science Quarterly* by E. P. Cheyney, on conspiracy and boycott cases, has brought out a very forcible reply from the *Commercial and Financial Chronicle*. The former believes that the courts have done the workmen scant justice in these matters. The latter defends the action of the courts, arguing that their work, even when they went rather out of their way to find law, has the elements of permanence and growth. The former proposes that State legislatures enact specific laws on this subject, to curb the disposition of the judges to build up a body of decisions affecting it, while the latter is wholly out of sympathy with such a course of procedure, believing that legislators would do well to keep their hands off. Mr. Cheyney alleges that the restraint of trade by labor organizations is a mere trifle compared with that which results from organizations of capital. The disturbance and fluctuation resulting from strikes is not peculiar to those trades where labor is organized, but is even more severe in some others. It is therefore, in his opinion, highly unfair to hold labor organizations responsible for such restraint or disturbance. Nor does he admit that all interference with the employer's independence is necessarily "unlawful." He holds that a business "cannot properly be looked upon as belonging entirely to the employer, but is, in a certain sense, a joint concern." The point with regard to coercion he admits as partly justified by the facts, but he believes that it has been exaggerated by the courts to an extent at once unwarrantable in theory and unwise in practice. He is especially severe on some of the decisions respecting boycotts, holding that the coercion of a boycott cannot be treated as a conspiracy, and that the action of labor combinations in such cases is to be regarded as an accidental rather than an essential element.

In reply to this the *Chronicle* says that the point where courts have been most clearly right and where Mr. Cheyney is most clearly wrong is on the question of interference with employers. Whenever labor disturbances reach an unusual height we have a conflict between two systems of management—one where the employer has the power of dictating the terms and the other where that power is to an equal or greater extent in the hands of employees. In specific cases the employer's power may be and often is abused; but in comparing one system with another there can be no question that it is better to give a man who controls the capital the power to arrange the methods of management, rather than to put it primarily into the hands of those who furnish the labor. The prevalence of the existing system is by no mere accident. It is a result of the survival of the fittest. The fact of its survival is to a great extent its justification. The control of industry by guilds of workmen involves more trouble and abuse and restriction to trade than its control by capitalists. As industry was organized on a larger and larger scale the necessity for capitalist control became more and more obvious. The failure of most of the efforts at co-operation in complicated industries only emphasizes the continuance of this necessity at the present time. The man

who furnishes the capital will generally manage the business more wisely and can be held more fully responsible to other parties in interest than the man who furnishes the labor, with little or no capital behind it.

Mr. Cheyney's general proposition, that what is right for one man to do is right for a large number to do by simultaneous motion, the *Chronicle* says, cannot be maintained. It is right for one man to walk down Broadway, but if 10,000 people agree to walk up and down a certain part of Broadway simultaneously, with the view of obstructing the traffic, the character of the action at once becomes changed. As Jevons says in discussing this matter, many of the arrangements of society are based upon the assumption that individuals will act as individuals. The streets of New York are arranged with a view to accommodate the ordinary demands of traffic, and will accommodate such demands as long as men act independently. If a number of persons insist on doing the same thing at the same time the fact of combination may make a difference at once in the convenience of the public and in the character of the action. So it was with boycotting. The combined refusal to buy of a certain person when he had given no direct ground of dissatisfaction to his patrons except the refusal to obey the demands of an organization more or less remote from him and connected with totally different matters was an obvious perversion of right.

It is clearly true that the decisions of the courts on these questions have been directly in line with public sentiment. The decisions would not have been received so quickly and with such general acquiescence if they had not been in entire harmony with intelligent public opinion. The efforts made in many States to set aside the effects of these decisions would otherwise have been successful, and the boycott would to-day be wielding its demoralizing power in many important industries. The courts have been sustained in the place of last and highest appeal, the minds and conscience of the people, and it is not likely that a new sentiment can now be awakened which will work a reversal of the judgment.

### Late Developments in Chili.

Chili has recently been attracting more attention in the United States since American railway builders succeeded in making a contract with the Government to build 600 miles of railway, for the construction of which there was competition from Europe. The only difficulty which arises with public works and private enterprises in that distant republic is the small immigration of laborers from Europe. To enable the American company to build the 600 miles alluded to the Government has, for example, engaged that the number of workmen required shall be forthcoming, and strenuous efforts are being made to push immigration from Europe and elsewhere. Thus some 3000 laborers were picked up and shipped to Valparaiso at the time of the recent collapse of the Panama Canal enterprise. While Brazil has received 120,000 immigrants and the Argentine Republic 300,000 this year, it is difficult to establish a good current from

Europe to Chili, although the latter is in every respect as desirable to settle in as either of the other countries, if not more so. The only difference is that it lies on the west coast and is, therefore, more out of the way. In a year or two there will be a change in this respect, as the Trans-andine Railroad, to connect Buenos Ayres with Valparaiso via Mendoza, will then be in operation all the way through across the Andes. Even now the Argentine Republic is beginning to restrict the number of certain undesirable new-comers from Italy which the general rush thither carries along, and gradually the great inducements which Chili holds out will no doubt procure the latter all the hands needed, thus somewhat dividing the current which almost overwhelms the neighboring State.

Chili stands at present in all the greater need of a copious influx of desirable immigration, as the spirit of enterprise which animates both the Government and the ruling classes has at no time been greater. The finances of the Republic are improving year by year, and its bonds are looked upon as gilt-edged in Europe. Thus the entire indebtedness of a nation of 2,700,000 inhabitants did not exceed \$88,485,071 last year, including \$24,887,916 paper money in circulation gradually being withdrawn; \$40,000,000 of the above amount is payable in gold, abroad, and the balance in silver. The budget shows a surplus since 1886. In 1887 the income was \$45,888,954 and the outlay \$87,118,408; last year the amounts were respectively \$46,775,546 and \$39,615,770. The German Bank and Mendelssohn & Co., Berlin, took a  $\frac{1}{2}$  per cent. Government loan for £1,500,000 last month, the bonds commanding 104 to 108 in the London market. Nothing would be easier than to issue a £4,000,000 loan and redeem the paper money, but after due consideration it was decided more advisable not to disturb the local finances at a blow, the people of Chili finding their interests too much bound up with this paper circulation, at least for the present. The Government uses its surplus for the reduction of taxes and for public works. Thus Valparaiso is to have a dry-dock involving an outlay of \$4,000,000. Next, negotiations are going on with a French company for the building of additional light-houses, in which the electric light will be used, the cost being estimated at \$8,500,000. This amount will in course of time be coming back in the shape of additional ships' dues. The Government income accruing from nitrate refining works is rapidly on the increase, and there is consequently all the greater readiness to reduce taxes. The one on inheritances is to be abolished, also on the furniture in use by residents, and, furthermore, the duties on certain articles of necessity are to be lowered.

The so-called trade balance is all along in favor of that country, as is shown by the following table of imports and exports:

	1886.	1887.	1888.
Imports.....	\$50,000,000	\$48,630,862	\$44,170,147
Exports .....	70,000,000	59,549,958	51,240,149
Excess of exports.....	\$20,000,000	\$10,919,096	\$7,070,002

This year the exports may not reach last year's value in consequence of the decline in copper. The exports of this commodity during the first five months were as under, in tons fine:

Years..	1884.	1885.	1886.	1887.	1888.	1889.
Tons....	20,604	19,797	18,150	14,587	14,841	12,680

The exports of nitrate were as follows for the first two months (January and February) of each year:

Years.	1887.	1888.	1889.
Quintals	1,561,132	1,908,327	3,606,086

During the entire years 1886, 1887 and 1888 the shipments were as follows:

Years	1886.	1887.	1888.
Quintals	9,805,238	15,851,567	16,741,019

Nitrate production increases so rapidly because it is so very profitable. During the eight years from 1880 to 1887 inclusive the exports aggregated 66,532,152 quintals, netting \$26,612,861 paper-money profit to the refiners. The quintal equals 101½ pounds American. The bulk of this industry is in English hands. Chili's wheat exportation has ranged between \$4,000,000 and \$6,000,000 annually during late years, the flour selling well on the Pacific Coast. Almost the sole importation from Chili into the United States is nitrate, of which we usually receive about 1,800,000 quintals annually. The exchange of commodities with Chili is shown in the following table:

Calendar year.	Imports from Chili.	Exports to Chili.
1886	\$2,497,325	\$2,188,259
1887	1,531,140	2,376,611

As the proposed lowering of the Chilean duties would favor our goods particularly, we have fair chances for a decided increase in trade in that direction.

The American Institute of Mining Engineers are holding their fifty-fourth meeting this week in Colorado, the session having begun at Denver on the 18th inst. The annual convention for 1889 of the American Society of Civil Engineers began its session at Seabright, N. J., to-day. Many of the most active and prominent members of these engineering societies are at present in Europe.

**The American Exchange Bank Loses.**—An important decision was handed down by the Court of Appeals in the case of Marshall Cutler and others against the American Exchange National Bank, in which they affirmed the judgment of the Superior Court of New York in favor of the plaintiffs. The action was brought to recover \$500 from the bank upon a letter of advice. The plaintiffs, on July 20, 1888, deposited with the defendant bank \$500 for the purpose of having it transmitted to Leadville, Col., and received for that purpose the letter of advice, which represented on its face that \$500 had been deposited with the defendant bank to the credit of the bank in Leadville for the use of J. Seymour Hall. The plaintiffs took the paper, and before it could be presented to the bank of Leadville it failed. The failure took place on July 26. A receiver was appointed who refused to pay the \$500 deposited. Suit was then brought by the plaintiffs to recover the amount in suit from the defendants, who refused on demand to return the money. The bank's defense was that as the plaintiffs had accepted the letter of advice, which said that the money was deposited to the credit of the bank of Leadville, they were estopped from denying that the money had actually come into the possession of that bank. The Court of Appeals has now affirmed the decision of Judges Sedgwick and O'Gorman in favor of the plaintiffs.

During the month of May the two stacks of the Isabella Furnace Company, at Etna, Pa., produced 13,070 tons of 2268 pounds of No. 1 foundry pig-iron. This is the largest production for the same length of time in the history of the furnaces.

## Our Production of Gold and Silver.

The report of Dr. James P. Kimball, Director of the Mint, has just been issued. From it we take the following statements relative to the production of gold and silver in this country in recent years:

The produce of gold from mines in the United States during the calendar year 1888 is estimated to have been 1,604,841 fine ounces (49,917 kg.), of the value of \$33,175,000.

Messrs. Wells, Fargo & Co., in their annual statement, estimate the gold produce of the States and Territories of the United States west of the Missouri River as \$29,987,702 in 1888, which is considerably less than the estimate of this bureau. Their estimate for 1887, of \$32,500,067, agreed substantially with that of this bureau, the latter being, for the whole country, \$33,000,000.

The value of the gold produced in the United States annually since 1880, according to the estimates of this bureau, is exhibited in the following table:

Years.	Weight, fine ounces.	Value.
1880	1,741,500	\$36,000,000
1881	1,678,612	34,700,000
1882	1,572,187	32,500,000
1883	1,451,250	30,000,000
1884	1,489,950	30,800,000
1885	1,538,325	31,800,000
1886	1,693,125	35,000,000
1887	1,596,375	33,000,000
1888	1,604,841	33,175,000

The produce of silver from mines in the United States during the calendar year 1888 is estimated to have been 45,783,632 fine ounces (1,424,826 kg.), of the coining value of \$59,195,000.

This is an increase of 4,515,327 fine ounces over the estimated production for 1887.

The elimination from an estimate of the produce of our own mines of the value of foreign material, consisting principally of refined silver obtained from crude silver, base bullion, and miscellaneous smelting ores imported from Mexico, has been attended, as in the last few years, with no little trouble.

The influx into the United States of such silver products in considerable quantities for reduction and refining, beginning in 1885, has since steadily increased, owing to the extension of railways into Mexico, and very largely to the fact that most of the silver-bearing ores are rich in lead, which, under rulings of the Treasury Department, is free of duty when contained in ores in which the precious metals constitute the predominant value.

So important has it become to identify and eliminate for statistical purposes this foreign product from the produce of our own mines that custom-house officers on the Mexican frontier and on the Gulf have been required to furnish this bureau with monthly statements showing in detail the class of material imported and the names of consignees.

According to custom-house returns the value of silver bullion imported into the United States during the last calendar year was \$5,977,036. This value of silver bullion is understood to be the commercial or market value, in which terms silver imports are manifested.

Of this foreign silver bullion \$5,054,402 was from Mexico, and most of the remainder from the United States of Colombia, with a small value from Honduras, and a smaller value from the British possessions in North America, and from Cuba.

In addition to the imports of foreign silver bullion, silver ores were imported of the declared commercial value, according to custom-house returns, of \$5,684,098. Most of these ores were imported through the ports of entry of the customs district of Paso del Norte. The collector of cus-

toms at El Paso informs the bureau that of the declared value of silver ores imported in his district during the year the value of the gold contained was \$16,313 of the lead \$332,944, and of copper \$1870.

These figures are the more useful as measures have been adopted in the customs district of Paso del Norte to verify by assay the important mineral and metallic products from Mexico entered at the several custom-houses.

Deducting the value of the gold, lead and copper contained in silver ores, the commercial value of the silver contained in ores imported was \$4,832,966.

Of the silver ores imported the value of \$4,450,363 was from Mexico, \$1,208,190 from the British possessions in North America, the remainder being small lots from various countries.

The total commercial value of foreign silver bullion and of silver contained in foreign ores imported into the United States during the calendar year 1888 was therefore, according to custom-house reports, \$1,810,002. The average price of silver during the year, based upon daily cable dispatches from London to the bureau of the Mint, was 42.869d per ounce British standard, equivalent, at the par of exchange, to \$0.93,974 per ounce fine. For the purposes of this report the average price is taken as \$0.93 per fine ounce. At this value the silver imports contained 11,500,000 fine ounces, worth at coining rate in silver dollars \$14,868,686.

The production of silver in the United States since 1880 is exhibited in the following table:

Years.	Fine ounces.	Coinage value.
1880	30,318,750	\$39,200,000
1881	33,257,812	43,000,000
1882	36,196,875	46,800,000
1883	35,732,812	46,200,000
1884	37,743,750	48,800,000
1885	39,909,375	51,600,000
1886	39,445,312	51,000,000
1887	41,268,505	53,357,000
1888	45,783,632	59,195,000

Dr. Kimball has made the following estimate of the world's production of gold and silver in 1887, gathering the information from a great variety of sources. A kilogram of gold is equal to \$664.60; of silver, \$41.56. The coining rate of silver is in United States silver dollars:

Countries.	1887.			
	Gold.		Silver.	
	Kilos.	Dollars.	Kilos.	Dollars.
Unit'd States	49,654	33,000,000	1,368,855	56,857,000
Australasia.	41,119	27,327,500	6,422	268,900
Mexico	1,240	824,000	904,000	37,570,000
European countries:				
Russia	30,232	20,092,000	13,522	562,000
Germany	2,251	1,460,000	23,929	984,500
Austria				
Hungary	1,877	1,247,450	53,391	2,218,900
Sweden	84	55,550	5,823	242,250
Norway			7,200	299,000
Italy	195	129,800	33,859	1,408,350
Spain			54,335	2,258,000
Turkey	10	7,000	3,323	55,000
France			46,789	1,944,550
Great Britain	2	1,000	9,964	414,100
Dominion of Canada	2,061	1,369,700	10,865	451,550
South American countries:				
Argentina Republic	45	30,000	722	30,000
Colombia	4,514	3,000,000	24,061	1,000,000
Bolivia	109	72,000	240,616	10,000,000
Chili	2,365	1,591,400	205,432	8,537,350
Brazil	1,532	998,000	141	5,350
Venezuela	5,020	3,398,000		
Peru	170	113,000	49,750	2,067,550
Central American countries:				
Costa Rica	131	87,000		
Honduras			1,799	74,750
Salvador	100	66,400	5,774	240,000
Japan	564	375,000	32,065	1,332,350
Africa	2,868	1,919,800	432	17,950
Ch'ia (Amoor district)	5,098	3,368,500		
India (British)	481	320,000		
Total	151,712	100,826,800	3,016,044	125,346,310

### Business Courtesy.

If it were possible to determine the money value of business courtesy the majority of people would be wonderfully surprised to find at how high a figure it was rated; and stranger yet, if this same quality could be gathered up or manufactured into a marketable form, we believe that it would find very few purchasers. In other words, courtesy is a something the worth of which is little appreciated, and most people would not care to take it even as a gift. How important a factor it is in the general affairs of life is not a question to be discussed in a trade paper, but on the other hand, it is eminently proper to point out the influence of this personal ingredient in the business world. Furthermore, the subject is especially pertinent just now, when the celebration of the centennial anniversary of General Washington's inauguration is turning men's thoughts back to the customs of the last century. To be sure, the chief attention is given to the military ways of our ancestors, but along with this there is a good deal of investigating into the every-day habits a hundred years, more or less, ago. Whoever looks up the history of business and reads old correspondence and papers relating to past methods of trading cannot but be struck by the more dignified and courteous tone that pervaded the dealings of the merchants then, and if the written records they have left are marked by an old-fashioned courtesy we can depend upon it that the manners of the day possessed the same charm. Is there no excuse to say that business men of the present are subject to such fierce competition and are so driven in their work that they have no time to waste in being courteous, for a gentlemanly manner will facilitate rather than delay a trade, even if it is but swapping jack-knives. Furthermore, as there is little prospect of the hurry of business life abating yet awhile, we should be all the more careful to guard against the consequences that come from fret and worry, lest our future behavior become intolerably rough.

Looking at the matter simply from a mercenary stand-point, it will require but little reflection on the part of sensible people to discover that courtesy in business brings an actual money reward. There is no one but can recall instances in his experience where the manner of a salesman had as much to do with a bargain as the quality of the goods. It would seem to be true, however, that this personal element enters with greater force in small transactions than in large ones, for where considerable money is involved we are less influenced by our feelings in the matter. A pleasant address will win a fortune for a book agent, while the president of a big corporation can be as crotchety as he pleases without coming to bankruptcy. Nevertheless, the amount of business lost through the offensive behavior of a company's agents is an indeterminate factor, and very likely it is the difficulty of estimating the losses from this cause that makes us undervalue it. If, as not infrequently happens, we are kept from purchasing a lot of goods or from awarding a contract by a disagreeable manner, we are not apt to tell the person the reason why we do not trade with him, and such people are seldom modest enough to divine our motives. But if it is the price of the work or quality of the goods that deter us, we have no hesitation in letting our reasons be known. In the first instance, the man injures his interests without knowing how, and we will likely repeat the folly many times over, while in the second case we have cited the obstacle to the trade is understood and can readily

be removed. As we intimated above, the influence of courtesy increases as we approach the last division in the distributing trade, and is greatest with the retail salesman, but in every department of business it is too important a factor to be ignored. It is extremely difficult to write about this subject in a general way, and it would require an infinite number of practical illustrations to cover the whole field. The best we can hope to do is to direct attention to it, and let each one reason out for himself the money value of business courtesy. After all, courtesy is much like advertising; we know that it is a good thing, but cannot tell exactly how many dollars it is worth to us.

### The Wrecked Pennsylvania Bridges.

Iron structures will replace the wrecked bridges of the Pennsylvania Railroad on the Juniata River. The principal bridges are the Granville Bridge, near Lewistown Junction. It is 640 feet long, iron, and of 5 spans, four of which were completely washed away. May's Bridge, two miles west of the Granville Bridge, 5 spans and 640 feet long, was completely wrecked and a new bridge will have to be built. The Manayunk Bridge, two miles west of McVeytown, was wrecked, and a new one of iron will be erected in its place. It is 640 feet long and has 5 spans. Besides these there are a number of one and two span bridges which have been more or less injured, and in all cases they will be repaired by the substitution of iron ones. Petersburg Bridge, near Shafer's Station, is a complete wreck. It is only 156 feet long, and was supposed to be strong enough to withstand the heaviest kind of a freshet. The Montgomery Bridge, which crosses the North Branch of the Susquehanna 22 miles from Sunbury, has just been repaired after nine days of hard work, but a new iron bridge will be erected. Shuman's Bridge, near Tyrone, is 310 feet long. A new iron bridge will be erected in its place. The Viaduct Bridge was a magnificent one-arch stone structure 80 feet long, about eight miles east of Johnstown. It was built by the State in 1832 and has stood many an uprising of the waters. It was considered a fine work of mechanism, but the last rise in the waters around Johnstown was too much for it and it succumbed with the weaker bridges. A new bridge of stone will be erected in its place. Little Conemaugh Bridge No. 6, just east of Johnstown, an iron bridge of 2 spans, was totally washed away. A new one of stone will be erected in its place. South Fork Bridge, which crosses the Conemaugh River near South Fork, was an iron bridge of 2 spans. It was washed away and a new stone bridge will take its place. An official of the company said: "It has been our policy for the last few years to erect stone bridges wherever practicable, and as we have the chance to do so we will carry out our intention. Wherever the ground will permit we will hereafter erect a stone bridge."

### The Chain and Nail Trades.

The condition of the chain and nail trade workers, says the *London Engineer*, is an illustration of the terrible effects of unlimited and misguided competition for work among wholly uneducated work-people. Individual has conflicted against individual, until the work of each chain and nail maker is the work of a slave in a slavery of his own making and in a den of his own defilement. Publicity is creating a disposition to remedy this deplorable state of things. That the statements which have hitherto been made have in no way overdrawn the picture is evident from the annual report of

the chief inspector of factories. With reference to the operative chain-makers, the inspector states that while, after the prolonged strike of 1887, the chain-makers returned to work at the 4/ list—i. e., 4/ for making 1 cwt. of  $\frac{1}{4}$ -inch chain—at which price a steady man could earn 25/ a week, yet, to get iron out of the warehouse, too many would undertake to do it for less, and had gone so far as to undertake making it at as low a figure as 1/9 per cwt. This, it is easy to calculate, would reduce wages to below 12/ a week. With reference to the nail-makers, the report is fully confirmatory of all that has previously been said upon this subject. As instances of low wages, a case is quoted where a woman made 5000 hob-nails in a week, for which she got 2/7 $\frac{1}{2}$ , and this was a good week's work, considering that house and children had to be looked after. In another instance a worker gets 2/6 a bundle for making rivets, and can in a full week earn 4/. Another gets 3 $\frac{1}{2}$ d for making 12 dozen "tangs," and has to work hard to make 5/ a week. A man making  $\frac{1}{4}$ -inch chain, working about 67 hours a week in front of a hot fire, can clear 12/ a week. It has been suggested that the chain shops should be closed by act of Parliament at 6 p. m., to prevent excessive labor and also competition from colliers and other outsiders. As to the nail trade, that is undoubtedly a declining industry; but there seems to be no reason why a more speedy termination should not be put to hand labor by the more extensive and rapid introduction of machinery.

A large section of the manufacturing district of lower Jersey City was wiped out by fire Tuesday night. The fire originated in a small structure in the rear of N. B. Cushing's machine works, a five-story brick building, near the piers and yards of the Red Star and Inman steamships, and all were burnt. William Brown's boiler works, a two-story frame building, was next destroyed. At the same time Tooker & Sayre's syrup refinery was burned. The Wallis Iron Works, a two-story frame building opposite Cushing's, were ignited. Cushing's building cost \$55,000. The machinery and stock were worth fully \$100,000 more. The loss on the refinery building and stock is estimated at \$125,000. Brown's boiler shop was damaged about \$10,000 and the Wallis Iron Works about \$3000.

The annual meetings of the Duluth and Iron Range Railway and Minnesota Iron companies were recently held at Duluth, Minn. In the railroad company the only changes were the election of M. J. Carpenter as vice-president and director, in place of R. H. Lee, and D. H. Bacon director, in place of Samuel P. Ely. In the iron company the only change was the election of R. H. Lee as director and member of the Executive Committee, in place of C. Tower, Jr. The surplus for the year, \$1,300,000, was voted to be used at the discretion of the Executive Committee for the improvement of the property. It is learned, though not officially, that this means no less than the building by the company of a line of vessels to carry their ore.

Judge Advocate General Rogers, of the Johnstown Bureau of Information, now estimates that not over 4000 lives were lost in the flood. He bases his calculation on the census returns and the reports which have been made to his office. He thinks that the number given will certainly cover the loss, and that it may be as low as 8000. This varies widely from the estimates made a week ago, that the total number of lives lost would be from 12,000 to 15,000.

# TRADE REPORT.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., June 18, 1889.

**Fig-Iron.**—The market has been very active during the past week, and a great many lots are believed to have been arranged for on private terms. A considerable business has been done at prices fractionally higher than last week's quotations, while in other instances the quantity called for was cut down about one-half before the sellers would agree to close the contract. From this it will be seen that the change of feature intimated in our recent reports has become more pronounced, so much so, in fact, that the market may be called strong, with an advancing tendency, and that without any qualification whatever. Of course it is not expected that there will be any great boom in Iron, but the advance which now averages 50¢ per ton may easily be increased to \$1 within a few days, and for some brands possibly a trifle more than that. But in many cases prices were ruinously low, and as the cost of production is said to be a full 50¢ more than it was a month ago, sellers have not reaped much benefit from the advance so far. The more hopeful feeling, however, is due to the fact that there is no difficulty in finding buyers at current rates and in the belief that the period of extreme depression has been passed, and that still further improvement in values is only a question of time. The great difficulty to-day would be to find some one willing to quote on anything like large lots. Regular customers are favored with their usual quantities for prompt delivery at, say, \$14.75 @ \$15 for good Gray Forge; \$16 @ \$16.50 for No. 2, and \$17 @ \$17.50 for No. 1. It would have to be a very good buyer or a brand of secondary character at the inside quotation, while large orders would not be accepted at the outside figure unless for very early deliveries. Southern Irons have been largely sold presumably at about \$14, ex-ship, for No. 1 Mill, said to correspond with Pennsylvania Gray Forge. Foundry grades are held at figures nearly approaching to those asked for local Irons, but some of the largest concerns have withdrawn from the market, so that prices are more or less nominal.

**Blooms.**—The market is unsettled and prices hard to quote, as some of the leading sellers are out of the market. Others ask an advance of 50¢ @ \$1 per ton, while still others profess to accept orders from their customers at the old prices. Several large sales are reported, but prices have not been made public. We repeat last week's quotations, although in the present condition of the market the outside figures would probably be required in the majority of cases, viz: \$28 @ \$28.50, at mill, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck-Bars.**—The same unsettled feeling may be noticed in this department. Sales have been made as high as \$28, delivered, some holders now quoting \$28.50. There is a good deal of inquiry, but very few sellers, hence the feeling is one of much firmness, although the advance is thought to be somewhat extreme compared with that in other specialties.

**Bar-Iron.**—While there is a much firmer feeling in Bars prices have not advanced, as might have been expected, considering the movement in other depart-

ments. Some of the best brands are held at 1.85¢ @ 1.90¢, but others are still hanging around 1.75¢ @ 1.80¢, with certain Western makes available at still lower figures. There is a gradual increase in the volume of business, however, and as soon as the many little country mills get filled up with work more uniformity in prices is expected. Skelp Iron shows some improvement in demand, but prices remain at about 1.75¢ for Grooved and 1.95¢ @ 2¢ for Sheared. The actual change in prices since last week is very trifling, but the increase in demand is considered a strong feature, and will doubtless develop into higher prices before long.

**Plate and Tank Material.**—The demand has been largely in excess of the supply, so that prices have shown a steadily-hardening tendency. All descriptions have been called for, and mills are now full of work for some weeks to come. Prices are higher, but vary according to circumstances and according to the way certain mills are situated for making deliveries. In a general way the following inside quotations represent prices f.o.b. cars at mills, and the outside figures are for deliveries in consumers' yards: 2¢ @ 2.2¢ for Ordinary Plates and Tank Plates; 2¢ @ 2.25¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.25¢; Fire-Box, 3.7¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.30¢; Shell, 2.5¢ @ 2.7¢; Flange, 2½¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

**Structural Material.**—Business has been very active in this department, mills all full of work, with prices firm and advancing. Beyond that there is nothing more to be said, except that prospects are decidedly favorable and that work during the summer is likely to be abundant. Quotations are about as follows: Bridge Plate, 2.05¢ @ 2.15¢; Angles, 2.1¢ @ 2.2¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet-Iron.**—There is all the business that mills are inclined to accept at present prices. The feeling is firm, and it is believed that some advance will be made soon, but in the meantime prices are about as follows for carload lots:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	8½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3½¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	65 %
Common, discount.....	67½ %

**Steel Rails.**—The market is dull but firm at \$27.50 @ \$28 at mill. Sales during the week have not been important, but there is plenty of work on hand for the present, so that there is no disposition to shade quoted rates. Prospects are considered to be favorable for a further stiffening in prices, as there is a considerable amount of business to be placed during the summer months.

**Old Rails.**—Prices are entirely nominal at about \$22.50, spot, Philadelphia, or \$23 @ \$23.50 delivered in the interior. There is but little inquiry, and an equally light supply.

**Scrap-Iron.**—Prices are firm and the supply of good Scrap decidedly scarce, but no quotable change can be made at present, although sales are chiefly at outside figures, as follows: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$16.50 @ \$17.50; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The demand is very active and prices are firm, with an advancing tendency, although discounts for the present remain as before, viz.: Butt-Welded Black, 52½ ¢; Lap-Welded Black, 65 ¢; Butt-Welded Galvanized, 45 ¢; Lap-Welded Galvanized, 52½ ¢; Boiler Tubes, 60 ¢.

**Nails.**—There is a pretty good demand from the building trade and a very active one from speculators. Mills limit sales to their regular customers and claim \$1.90 to be an outside price for carload lots. Store prices are about \$2.

Mr. Wm. H. McElroy, for the past 12 years with the Phoenix Iron Company, at their works, Phoenixville, Pa., has resigned his position to enter into the Iron and Steel commission business with R. E. Anthony, Jr., of Brooklyn, N. Y., and has secured offices at 328 Chestnut street, Philadelphia.

## Chicago.

Office of *The Iron Age*, 50 Dearborn street,  
CHICAGO, June 17, 1889.

**Fig-Iron.**—The only change in the condition of the market as described a week ago is in Southern and Ohio Irons. Local furnaces have been selling at figures that made it absolutely impossible to sell outside Coke and Charcoal Irons here at a profit. Manufacturers recognized this fact, and nearly every sales-agent handling Southern grades has been notified that the furnaces are "sold up"—better prices being obtained in other markets. In many instances extra concessions on immediate shipments were offered them by their local branch roads, which it was hoped, with the new freight rate, would help the maker in placing some of the surplus stock, but local furnace men have the advantage under all circumstances, and they intend keeping it so long as they have a ton of Iron to sell. In Soft Irons, Gray Forge and Mottled used in mixtures there is no local competition, and manufacturers were free to take in a good many orders. The demand was very free and prices consequently advanced from 25¢ to 50¢ per ton. On this grade of Iron we change quotations accordingly, but on Saturday it was rumored that railroads fighting for business had made a cut of 35¢ per ton from Birmingham, making the rate \$3.65, as against \$4. If this rumor proves correct our prices will be that much above the market. Transactions in Coke and Charcoal Irons were frequent and no concessions made for quantity. Long-time deliveries are not accepted so ravingly as some weeks ago and command the top price. Car-Wheel Irons have been in better request, but sales were not augmented to the extent anticipated. A very small proportion of the cars contracted for came to this vicinity, hence no extra amount of Iron was required for Wheel purposes. We make the following quotations, cash, f.o.b. Chicago: Lake Superior Charcoal, \$18.50 @ \$19; Local Coke, No. 1, \$15.50; No. 2, \$14.50; No. 3, \$13.50; Chicago and Bay View Scotch, \$15.50 @ \$16; American Scotch (Blackband), \$18; Southern Coke, No. 1 Foundry, \$15.75; No. 2 Foundry and No. 1 Soft, \$15.25; No. 3 Foundry, \$14; No. 2 Soft, \$14.25; Gray Forge, \$13.00; Mottled, \$13.25; Hanging Rock, No. 1, \$18.25; Jackson County Silvery, No. 1, \$18; Tennessee Charcoal, No. 1, \$18.75; Alabama Car-Wheel, \$24 @ \$25.

**Bar-Iron.**—As the end of the month approaches manufacturers are becoming more chary about taking orders at any price. Some of the mills East and West have declined to bid on specifications for July, August and September deliveries, and all those who do name prices all the way from \$1 to \$2 per ton higher at mill. Prices are nevertheless irregular and vary



according to quality and uses. On Common Bars, \$1.60, and on Single Refined, \$1.75, including half extras, f.o.b., Chicago, is a general quotation made by the lowest sellers. Mills having begun to show a little firmness, buyers are placing their orders more rapidly and inquiries are not falling off. Best Refined is not getting its share of attention. There are a good many consumers who hesitate about placing their full orders with the cheap makers and only one mill. Out of store jobbers quote Common and Single Refined at \$1.65 @ \$1.75, and the better grades at \$1.80 @ \$1.90.

**Structural Iron.**—It now looks as though there would be a very fair trade in Builders' Shapes during the summer and early fall. Foundries are all pressed for estimates and quite a lot of little contracts are made every week. Several large structures—one 10, another 12 and another 14 stories—are under negotiation, and operations are to begin soon. Bridge Material for new and repair work is in good request. On these prices may be a shade firmer, but unchanged in quotations, as follows, f.o.b. Chicago: Angles, 2.10¢ @ 2.12½¢; Universal Plates, 2.15¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. Small lots from store are quoted at 2.20¢ @ 2.30¢ for Angles, 2.65¢ @ 2.70¢ for Tees and 3.40¢ for Beams.

**Plates, Tubes, &c.**—Jobbers report no change in the general condition of the market. Consumption is confined to small-lot buyers. Large orders for new work are talked of but not placed. Prices remain quite steady on Iron and Steel Plates and advanced on Tubes. The following quotations from store are made: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 55 % off for 1½-inch and less and 60 % off for 2-inch and larger.

**Sheet-Iron.**—Because manufacturers do not want additional orders the impression prevails that there will be some labor trouble in the Sheet mills next month. Jobbers who have stock under contract are pressing for deliveries and holding prices firm. From store they quote on a basis of 2.20¢ for No. 27, and mills quote on the same basis and number 2.90¢ @ 2.95¢, f.o.b. Chicago.

**Galvanized Iron.**—The market continues to be in about the same condition as a week ago. Orders are quite numerous in small lots, but heavy buyers are not placing their orders. Stocks in all sizes are in good supply and prices pretty closely adhered to. On Juniata jobbers quote 65 % off and on Charcoal 65 % and 5 % off.

**Merchant Steel.**—Low-grade Steels continue to have the call. Consumers begin to realize that the chances for lower prices are very slim. While that class of manufacturers who do not make stock goods are not inclined to buy heavily, they nevertheless are stocking up gradually and accumulating from time to time a little more material than their immediate wants require. A good many of the agricultural implement men have placed their orders for the next year's supply, but there are still many who are waiting for further indications that prices have reached bottom. The Chicago office of the Gautier Steel Department have issued a circular in which they say: "We shall be prepared in 30 to 45 days to fill any orders you may favor us with for Tire, Machinery, Toe-Calk and Spring Steel; also for Finger-Bars, Rake-Tooth Steel and Finished Rake Teeth, Bundle-Carrier Teeth, &c." If they can do this, it will have a

tendency to divert some of the orders on which inquiries have been made in this market recently. Manufacturers quote f.o.b. Chicago on round lots of Open-Hearth Spring Steel, 2.25¢; Open-Hearth Machinery, 2.10¢; Tire Steel, 2.15¢; Toe Calk, 2.30¢, flat; Soft Bessemer Steels, 1.90¢ rates. The following quotations are from store: Mixed Machinery Steel, 2.10¢ @ 2.20¢; Tool Steel, 7.75¢ @ 8.50¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.50¢ @ 3¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Track Supplies.**—The demand for this class of shapes has not run into large orders. Prices on Fish-Plates vary with the quantity and time of delivery from 1.70¢ to 1.90¢. Bolts with Square Nuts are quoted at 2.50¢; with Hexagon Nuts, 2.60¢ @ 2.70¢; Spikes, 1.85¢ @ 1.90¢; Hot-Pressed Square Nuts, 5.85¢ discount; Hexagon Nuts, 6.35¢ discount.

**Steel Rails.**—The demand for Steel Rails in the past week has been very slow. Railroad companies that were greatly in need of Rails got into the market early in the month. The mills here are consequently filled up entirely for June and July. The C., R. I. & P. R. R. Co., it is said, will build a line of 100 miles through the Oklahoma Territory, for which they will need a quantity of new Rails. There are several other new branches spoken of, but so far as known none are ready to contract for the necessary supplies. On Heavy Sections mills continue to quote \$29 @ \$30. There has been considerable demand for Light Iron Rails for street car purposes. On 12-lb Rails manufacturers are asking \$34 @ \$36; on 30-lb Rails, \$38. This is a slight advance over prices of several weeks ago; \$32 was refused on a 100-ton lot within the last week.

**Old Rails and Wheels.**—The demand for Old Rails has been quite brisk, but sales very limited. In the first place stocks are scarce in this market and those who have Rails to sell are inclined to hold them for higher prices. On small lots \$20.25 has been offered. Sellers are asking from \$20.50 to \$23. The demand for Old Steel Rails is not urgent and prices are nominally quoted at \$17 @ \$18 for long lengths and \$14 @ \$15 for short pieces. Old Car-Wheels are in pretty good demand, but the exalted idea of their value on the part of sellers has thus far prevented any large sales. Offers of \$17 @ \$17.50 have been made by buyers, but the asking price ranges from \$18 to \$19.

**Scrap.**—There appears to be a little more activity in the Scrap market. Sales of 1000 to 1500 tons Wrought Scrap are reported. Railroad companies are offering only small lots, and dealers are holding their prices a trifle stronger than several weeks ago. Manufacturers do not take hold in very large quantities and are inclined to discredit the probability of prices advancing. Dealers' quotations on 2000 lb are as follows: No. 1 Wrought, \$17.50; Fish-Plates, \$18; Axles, \$21; Horse-shoes, \$17; No. 1 Mill, \$13; Cast Machinery, \$11; Stove Plate, \$9; Cast Borings, \$8; Wrought Turnings, \$10; Coil Steel, \$13; Leaf Steel, \$14.50; Locomotive Tires, \$14.50; Track Scrap, \$16; Mixed Country Wrought, \$12.

**General Hardware.**—Nothing of importance has transpired since our last report. The leading jobbers of this city are doing a very nice trade in Shelf Goods and other staple articles. The demand for Heavy Hardware is lighter. No new prices were announced during the week and all the advances heretofore made are being well sustained.

**Nails.**—This market is so unsettled that it is difficult to express an opinion which will give a definite idea of the situation. The manufacturers who are selling Nails at the ruinous prices of a week ago have withdrawn from the market, but in their stead we find another set of men who have taken offence at the action of their brethren, and are now preparing to (if not already doing so) discount the price at which Nails have been sold. As they recognize that most of the jobbers have obtained pretty large supplies, and that they cannot do much in a jobbing way, they intend going direct to the large retailers throughout the country soliciting carload orders. The unprecedentedly low freight rates from Pittsburgh, Wheeling and Ohio Valley to St. Paul and Missouri River points makes it possible for goods to be shipped into those sections at nearly the same prices for which they can be laid down in Chicago. Should they proceed in their undertaking they will through this means be able to stock up all the principal dealers in the West. This will result in arousing the jobbers, who undoubtedly will meet whatever prices are made by the manufacturers. Under the disturbed condition of the market the majority of dealers would not feel inclined to take full carloads, which would exclude the manufacturers and leave the jobbers an opportunity of selling small lots or mixed cars at the same price the manufacturer had named, and in a measure deprive him of some trade. From stock jobbers are quoting \$1.85 for Cut Nails and \$2.80 for Wire Nails. Mixed carloads in small lots Cut Steel Nails are quoted at \$1.90 and Wire Nails at \$2.35. It is not surprising that Wire Nails are suffering from the demoralized condition of the Cut-Nail trade. Manufacturers readily see that in order to compete with the Cut Nail it will be necessary for them to reduce their prices. This has not yet been done, but there is a probability that lower prices will be made before the close of the week. Manufacturers of Wire Nails are making an effort to have the jobbers adopt their last price-list on small goods. The jobbers are making serious objections to it, and it is not likely that it will come into operation.

**Barb-Wire.**—The conditions of the market remain precisely the same as heretofore. Manufacturers in the West are running their mills full on orders and not accumulating any stock. Jobbers' price in small lots from store is 2.75¢ on Painted and 3.85¢ on Galvanized. Some of the Eastern mills evidently are not so well situated, as we hear of orders of carload lots delivered on the Mississippi River at about the same figures that jobbers are asking here in carloads. Here also comes into play the discrimination in favor of Eastern manufacturers on through freight rates, which enables them to lay down Wire in Duluth as cheaply as they could in Chicago.

**Pig-Lead.**—There was no activity in the market last week, buyers apparently waiting for a change in the situation. Consumers are pretty well supplied for June and July, and there is no hurry in placing orders for August. Sales amount to about 200 tons at 3.80¢ @ 3.85¢, which was the ruling price at the close of the week.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, June 17, 1889.

**Pig-Iron.**—There appears to be an improvement all along the line in the tone of the market. No concessions are now being asked by buyers, and sales are being made on a basis of previous prices to an advance of 25¢ @ 50¢, so that upon the whole there is really an advance in the condition of the market. Anything like making a purchase of a round lot for future

delivery—that is to say, for a stated amount per month during the year—is now out of the question; it would take an advance of at least \$1 @ \$2 per ton to secure such a contract. None of the furnaces are suffering for orders, and it is safe to say that at prices that have ruled during the past few weeks there is not a furnace South but what could close out its entire output for the balance of the year. The above describes about the situation with the Southern Iron makers, and the future is being watched with much interest. A reduction in rates to some points North has been made, but how many points are affected is not yet known.

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,  
Pittsburgh, June 18, 1889.

In regard to the hitch between the Iron manufacturers and the Amalgamated Association there has been nothing of a decisive character developed as yet. The manufacturers have no organization, and the wage-scale agreed upon by the Amalgamated Association, which it is believed will be substantially the same as that of 1888-89, will be presented to each firm by the Mill Committee, and the indications at the present time are that the manufacturers generally will sign, and consequently there is not much probability of a strike. Our manufacturers say they cannot compete with Eastern manufacturers, who have a great advantage in the matter of wages. It is generally admitted that in regard to the wage-scale the Amalgamated Association display a good deal better generalship than the manufacturers, who for a year or more have had virtually no organization, and, of course, without organization there could be no co-operation; on the other hand, the Amalgamated Association are well organized, and consequently they have a decided advantage.

Our communication with the East via the Pennsylvania Railroad is again opened up, so far at least as relates to passengers and mail, but it will be some days yet before freight trains will be put on; in the course of another week, however, it is expected that the road will be in pretty good condition for business, but it will be a long time before the damage in the Conemaugh Valley is fully repaired. The railroad officials, it is understood, estimate the actual loss to the road at \$1,500,000, but this does not include the loss of business while the road is in its disabled condition, which will also be very heavy. However, while it is bad for the company it will make a largely increased demand for all kinds of Railway Supplies, Rails, &c. Bridge-builders also will come in for some pretty good-sized contracts. Moreover, the rebuilding of Johnstown and suburbs, both as to dwellings and manufacturing establishments, has already been commenced, which will require large quantities of Iron and Steel, to say nothing of machinery.

**Pig-Iron.**—There has been more activity the past week, with more buyers and fewer sellers, and while prices are not quotably higher, the market is firmer. The feeling generally obtains that hard pan has been reached, and furnacemen are refusing to make contracts for future delivery at present rates. While sales of Bessemer have been reported for immediate or near-by delivery at \$15.75 and even \$15.50, furnacemen are asking from 50c. to \$1 more for delivery during July or August. We quote prices as follows:

Neutral Gray Forge.....	\$13.85 @ \$14.00, cash
No. 2 Neutral Gray Forge.....	\$13.50 @ \$13.75, "
All-Ore Mill.....	14.50 @ 15.00, "
No. 1 Foundry.....	16.00 @ 16.25, "
No. 2 Foundry.....	15.00 @ 15.25, "
No. 3 Foundry.....	14.50 @ 14.75, "
White and Mottled.....	13.00 @ 13.50, "
No. 2 Charcoal Foundry.....	21.00 @ 22.00, "
Cold Blast Charcoal, No. 1.....	24.00 @ 27.00, "
Bessemer Iron.....	15.75 @ 16.00, "

**Muck-Bar.**—There is more inquiry and the market is firmer. We now quote at \$26 @ \$26.25, cash, with a sale of 1000 tons reported at \$26.25, cash. Manufacturers say there is nothing in it at present prices, and some of them are indifferent about selling.

**Manufactured Iron.**—The mills generally are pretty well employed, but there is no rush and no improvement in prices. First-quality Iron is still quoted upon a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2 % off for cash, but Old Rail Iron can be had for from  $\frac{1}{10}$ ¢ to  $\frac{1}{8}$ ¢ less. There is a continued good demand for Skelp Iron, and prices are steady at 1.60¢ @ 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared.

**Nails.**—The Nail trade continues unsettled and somewhat demoralized. What has been known as the Western Association has collapsed, and each firm is now free to do as it pleases. There are no regularly established prices, although makers continue to quote at \$1.80 @ \$1.90, 60 days, 2 % off for cash. Manufacturers, it is said, succeeded in unloading from 15,000 to 20,000 kegs at Chicago last week at very low prices. A firm having over 100 machines who wanted to go out of business offered to sell the whole lot at \$20 for each machine. Wire Nails are still quoted at \$2.25, 60 days, 2 % off for cash.

**Wrought-Iron Pipe.**—The meeting of the Pipe manufacturers in this city last week was largely attended, nearly all the mills in the country having been represented; business was very generally reported good; mills all busy, with every prospect of a continuance of the same until the advent of the winter season. Prices on Boiler Tubes and Line-Pipe were advanced, the rest of the list remaining unchanged. Discounts on Black Butt-Welded Pipe, 52½ %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 52½ %; Boiler Tubes, 1½ inches and smaller, 55 %; 2 inches and larger, 60 %; Casing, 5½ inches, 62½ %; other sizes, 60 %; 2-inch Tubing, 18¢ per foot, net; Line-Pipe, 2-inch, 10½¢ per foot, net; 2½-inch, 16¢; 3-inch, 21¢; 3½-inch, 25¢; 4-inch, 30¢; 4½-inch, 36¢; 5-inch, 42¢; 6-inch, 58¢; 7-inch, 70¢; 8-inch, 95¢; 9-inch, \$1.20; 10-inch, \$1.25; 12-inch, \$1.60.

**Old Rails.**—Continue in demand, with but few offerings, but prices remain about as last quoted, \$22 @ \$22.50, cash; sale of 500 tons at \$22.50. A large consumer here says he can get all he wants at \$20 at Chicago, which with freight added, \$2.20, would make them cost \$22.20 here. Old Steel Rails are still quoted at \$16 @ \$17 for short lengths and \$19 @ \$20 for long lengths.

**Steel Rails.**—Are still quoted at \$26 @ \$27, cash, at mill, and as mills are all pretty well sold out the market is firmer.

**Billets, Blooms, &c.**—Sales of Bessemer-Steel Billets reported at \$26.75 @ \$27.25, according to size, quality and delivery. Sales of Bessemer Nail Slabs at \$26.50. No recent sales of Bloom Ends or Rail Crops reported, in the absence of which it is difficult to give reliable quotations.

**Railway-Track Supplies.**—Railway Spikes have been reduced to 1.95¢, 30 days, free on cars at works; Splice Bars unchanged at 1.60¢ @ 1.70¢, and Track Bolts at \$2.75 with Square and \$2.85 with Hexagon Nuts.

**Old Material.**—Is in rather better demand and firmer, but prices remain unchanged. No. 1 Wrought Scrap, \$18, net ton; Old Car Axles, \$23.50 @ \$24; No. 1 Wrought Turnings, \$13 @ \$14; Cast Scrap, \$13.50 @ \$14, gross; Old Car-Wheels, nominal at \$18.

## Detroit.

**WILLIAM F. JARVIS & Co.,** under date of June 17, 1889, report as follows: While for several weeks past we have been able to report a large number of inquiries, we have been unable to report any large sales. However, during the week just past several large orders for Lake Superior Charcoal have been placed, and also enough small sales of 50 to 200 tons to make a large quantity in the aggregate. The demand for Coke Irons has not been as great as for Lake Superior Charcoal, but a considerable number of small orders for Ohio and Southern Irons have been booked. While prices remain about the same, there are very few furnaces willing to make concessions to obtain orders, and some have decided to make no further sales for delivery after September, unless at higher quotations than at present are ruling. We report an active market and quoted as follows:

Lake Superior Charcoal, all numbers.....	\$19.00 @ \$19.50
Lake Superior Coke, all ore.....	18.00 @ 18.50
Lake Superior Coke, cinder mixed.....	17.50 @ 18.00
Standard Ohio Black Band.....	18.00 @ 18.50
Southern No. 1.....	18.50 @ 19.00
Southern Gray Forge.....	18.00 @ 18.50
Southern Silvery.....	18.00 @ 18.50
Jackson County (Ohio) Silvery.....	18.00 @ 18.50
Old Wheels.....	18.50 @ 19.00

## St. Louis.

Office of *The Iron Age*, 214 N. Sixth st.,  
St. Louis, June 15, 1889.

**Pig Iron.**—The improved condition of trade noted in last week's report continues. Prices show more strength, and there is a gradual movement toward somewhat higher figures, although as yet there is no quotable advance. Offers for good round lots at prices that would have been accepted two weeks ago are now refused, and in some instances slight advances have been asked, these, however, for brands of superior excellence. There have been a number of sales made during the past week, to be delivered as per ordered, which indicates a legitimate demand, and shows an absence of buying for speculative purposes. Standard brands are scarce and firm, and cannot be bought at the low prices at which some Irons were recently offered. For ordinary-sized lots we quote as follows, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry.....	\$15.25 @ \$15.75
Southern Coke, No. 2 Foundry.....	14.75 @ 15.25
Southern Coke, No. 3 Foundry.....	14.25 @ 14.50
Gray Forge.....	13.25 @ 13.75
Ohio Softeners.....	17.00 @ 19.00
Lake Superior Charcoal.....	19.75 @ 21.50

Missouri.	
Charcoal Foundry, No. 1.....	16.00 @ 16.50
Charcoal Foundry, No. 2.....	15.00 @ 15.50

Tennessee.	
Charcoal Foundry, No. 1.....	17.00 @ 18.00
Charcoal Foundry, No. 2.....	16.50 @ 17.00

Connellsville Coke, f.o.b. East St. Louis, \$4.40; St. Louis, \$4.55.

**Bar Iron.**—Trade shows signs of improvement daily, and mills are kept fairly well employed. Jobbers are heavy buyers, as are also the Car-works, and some little demand emanates from the railroads; this latter, however, is not as heavy as was anticipated, but taking everything into consideration, the outlook is more promising than for some months past. Small lots from store are quoted at \$1.80; carload lots from \$1.60 to \$1.70, according to circumstances.

**Barb Wire.**—Trade is dull and prices remain as last quoted. Mills have enjoyed a good trade since the first of the year, but now the farming industry has little or no time to give to fence building, hence the dullness. Mills quote from \$2.80 to \$2.85 for Painted and from \$3.40 to \$3.45 for Galvanized; carload lots at from \$2.70 to \$2.75 for Painted and \$3.30 to \$3.35 for Galvanized, f.o.b. St. Louis.

## Louisville.

LOUISVILLE, KY., June 17, 1889.

**Pig-Iron.**—The market this week has shown increased stiffness, though some offerings have been made at very low prices. One or two of the prominent Southern furnaces have felt it wise not to offer their iron at present price and have withdrawn, and their views are about 50¢ a ton higher than Saturday. A few furnaces continue to sell at old prices, but we think the tendency of the market is upward and that prices will advance probably 50¢ @ 75¢ a ton. There has not been much Iron sold here during the past week, as buyers have not generally decided what action to take, but the disposition is to purchase for future delivery what Iron they desire during the year. Furnaces are meeting buyers' views to a certain extent where they are willing to pay 25¢ @ 50¢ over last week's prices. We quote as follows:

Southern Coke, No. 1 Foundry.	\$14.25 @ \$14.75
Southern Coke, No. 2 Foundry.	13.75 @ 14.25
Southern Coke, No. 8 Foundry.	13.00 @ 13.50
Gray Forge	12.50 @ 13.00
White and Mottled, different grades	12.00 @ 12.50
Silver Gray, different grades	12.50 @ 13.50
Southern Charcoal, No. 1 Foundry	16.00 @ 16.50
" " No. 1 Mill.	14.50 @ 15.00
Southern Car-Wheel, standard brands	21.75 @ 22.75
Southern Car-Wheel, other brands	18.00 @ 19.50
Hanging Rock Coke, No. 1 Foundry	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry	19.50 @ 21.00
Hanging Rock, Cold Blast	20.75 @ 22.75

## Cleveland.

CLEVELAND, June 17, 1889.

**Iron Ore.**—The market retains its activity. Ores of all grades are selling freely at prices slightly below the quotations established at the beginning of the season. Good Gogebic Ores that then commanded \$5 are now to be had for \$4.75 and the very best Ores from this range are selling for \$5, instead of \$5.25. Menominee Bessemer are bringing \$4.50 at present and are in fair demand at that figure. Few non-Bessemer Ores from any of the ranges can now be purchased, nearly the entire output of the mines having been previously contracted for. For the scattering lots occasionally reported sold about \$3.80 per ton is paid. Despite the energetic efforts of the vessel men to increase Lake freights plenty of tonnage can still be secured at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland. Indications are not wanting of an 80¢ rate from Escanaba before August. Ore is being pushed down from the Lake Superior district at a tremendous rate and the shipments are already nearly 1,000,000 tons ahead of those at a corresponding period last year. It is believed that 4,125,000 tons of Ore have already been sold.

**Pig-Iron.**—All the Iron now in stock could be easily disposed of at present prices. The demand is astonishing and the general tone of the market has considerably improved over last week. The advance in prices is, of course, purely speculative, but the extremely healthy condition of the Pig-Iron market seems to justify the belief that rock bottom has been reached and that future sales of Iron will be at prices slightly in advance of prevailing quotations. Nearly all the dealers in the city unite in the belief that better prices will come early in June.

**Scrap-Iron.**—Scattering sales of Old American Rails at \$21 are reported, but the market lacks activity. There is but small demand for Old Wheels, even at \$19. Old Axles are, however, selling freely.

**Nails.**—There is no material change in the situation. Steel Wire Nails at \$2.30 are in fair demand, and Steel Cut Nails at \$1.90 from store are selling with considerable freedom.

## Cincinnati.

Office of The Iron Age, Fourth and Main Sts. }  
CINCINNATI, June 17, 1889. }

**Pig-Iron.**—The low prices current for Pig-Iron have not only attracted larger buyers for various deliveries, but inquiries have been numerous from consumers of all kinds of metal anxious to test the temper of the market rather than to make purchases. Speculators, too, have entered the market for no small amounts, but have failed to secure the full quantity desired at inside prices. With one or two exceptions, there is less pressure to sell at the close, Forge Iron, especially, being held more firmly. In some instances buyers have made direct purchases from furnaces, profiting by the omission of the commission. Although production continues on a liberal scale, the report of stocks at furnaces shows a steady decline, and the conviction that the market has reached its lowest level is strengthened. There has been more demand for Car-Wheel Iron, and 3000 tons Southern sold at \$23, for delivery during the next three or four months. Among the other larger sales were 900 tons No. 3 Southern Coke Foundry at \$13.25; 1000 tons do. No. 2 at \$13.75; 600 tons No. 1 at \$14.35; 1000 tons do. at \$14.75, cash basis; 2000 tons Gray Forge at \$12.75, and 1500 tons Mottled at \$11.75, cash. Sales of carload lots to 200 tons have been numerous at proportionate prices. There is more general activity than has been the case for several months. Business affairs aside from Pig-Iron are improving, and so far as these matters have a bearing the prospect is decidedly improved, but a more active money market may modify the tendency toward better prices. The following are the approximate prices current here at the close for cash, f.o.b.:

<b>Foundry.</b>	
Southern Coke, No. 1	\$14.25 @ \$14.75
Southern Coke, No. 2	13.75 @ 14.25
Southern Coke, No. 3	13.25 @ 13.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 15.25
Mahoning and Shenango Valley	16.00 @ 16.50
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.00
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.00
<b>Forge.</b>	
Strong Neutral Coke	12.75 @ 13.00
Mottled Neutral Coke	11.75 @ 12.00
Gray Forge	12.75 @ 13.00

<b>Car-Wheel and Malleable Irons.</b>	
Southern Car-Wheel	20.00 @ 23.00
Hanging Rock, Cold Blast	22.00 @ 23.00
Lake Superior Car-Wheel and Malleable	20.00 @ 21.00

**Manufactured Iron.**—There has been some little increase in the orders placed, and mills and foundries are fairly busy on old contracts, but while there is a better feeling, there is no tendency toward higher prices.

**Nails.**—There has been a fair jobbing demand, but an easy tone has prevailed, without essential change in prices. Steel Nails, 12d and 40d, sell at \$1.80 @ \$1.90 per keg, with 10¢ rebate in carload lots at the mills, and Steel Wire Nails at \$2.40 @ \$2.50 per keg.

**Old Material.**—The demand for Rails has continued moderate, but the offerings have not been large and the market is fairly quotable at \$20, spot. There has been some inquiry for Old Wheels at \$16, cash, but offerings have been small.

## New York.

Office of The Iron Age, 65 and 68 Duane street, }  
New York, June 19, 1889. }

**Pig-Iron.**—Very decided activity has prevailed among those who are in a position to furnish Iron promptly. Sales are reported of numerous lots ranging from 50 tons to 2000 tons. A number of dealers have disposed of 1500 to 2000 tons each

during the past week, and one house reports transactions aggregating 6000 tons. The heavy purchases of material of all kinds by the railroads have undoubtedly stimulated the Pig-Iron market, and it is hoped that the impetus thus given may not be merely temporary. The buying movement now in progress has clearly demonstrated that both consumers and furnace companies were carrying light stocks. Some of the furnace companies have notified their agents to take no more orders at present, as their capacity is well covered for several months. Outstanding options have been withdrawn, and manufacturers are evidently getting themselves in readiness to take advantage of an upward movement in prices if the demand continues. Some dealers, however, take a conservative view of the situation, believing that consumers have pretty well covered their requirements for the time being and that there will not be sufficient activity to cause much of an advance. Here and there prices on various brands have been marked up 25¢ @ 50¢ per ton, but the general range continues about as previously quoted, namely: Northern Irons at tidewater, \$16.50 @ \$18 for No. 1, according to brand; \$15.50 @ \$17 for No. 2; \$14.50 @ \$15.25 for Gray Forge. Southern brands sell at \$16.25 @ \$17 for No. 1; \$15.50 @ \$16 for No. 2; \$14.75 @ \$15 for No. 3; \$14.25 @ \$14.50 for Gray Forge, all delivered at New York.

**Scotch Pig.**—Larger transactions are reported, with orders entered for future delivery, which is a feature of trade that has been wanting for some time. Quotations are as follows: Eglinton, \$19 @ \$19.50; Dalmellington, \$19.50 @ \$20; Summerlee, \$21.50; Langloan, \$21; Coltness, \$21.50 @ \$21.75.

**Spiegeleisen.**—Several thousand tons of 20 % were sold at about \$28. Small transactions in Ferro are reported at \$58 @ \$60 for 80 %.

**Wire-Rods.**—Quotations are nominal at \$48, ex-ship. No transactions are possible at this price.

**Structural Iron and Steel.**—The market is very active and strong. Quotations for delivery on dock are as follows: Sheared Plates, 2.05¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2.05¢ @ 2.1¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢.

**Plates.**—An excellent business is reported, with an upward tendency in prices still existing. Quotations are as follows for delivery on dock: Tank Iron, 2.05¢ @ 2.1¢; Shell, 2.4¢ @ 2.5¢; Steel Tank, 2.25¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.7¢ @ 2.8¢; Fire-box, 3.25¢ @ 4¢.

**Bar-Iron.**—The demand is not so heavy as for other classes of material, yet some good orders have been entered. Quotations for dock deliveries are as follows: Common, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.75¢ @ 1.9¢. Some mills are refusing to sell at less than 2¢.

**Merchant Steel.**—Business has been rather quiet, but orders are being received for shipment after the 1st of July, so as to throw them into the new fiscal year of manufacturing consumers. Some complaint is heard of slow collections. Tool Steel, good brands, in large lots, is still quoted at 7¢ @ 7½¢; specials, 12½¢ @ 20¢; Crucible Spring, 8½¢ @ 4¢; good Open-Hearth Machinery, 2.30¢ @ 2.5¢; common ditto, 2¢ @ 2.25¢; Open-Hearth Spring, 2½¢ @ 2.5¢; Sheet, 6½¢, 8½¢ and 10½¢.

**Steel Rails.**—The mills are now so well supplied with work that railroad companies are finding some difficulty in arranging for early deliveries. The sales of the week have been confined to small lots, the largest reported consisting of 8000 tons. A good movement in light-weight Rails is

in progress. They are being placed on the basis of \$28 at mill for heavy sections, which is the rate now quoted on small orders. Quotations on large contracts are firm at \$27.50 at mill. Speculative lots, taken some time since, are being pressed on the market, but the holders of such contracts are finding it very difficult to dispose of them for some reason.

**Track Supplies.**—A much better feeling obtains among sellers. A heavy volume of business is reported, with quite a number of negotiations pending. Some mills are now filled up on Fish-Plates to August, and prices are naturally firmer with their withdrawal from the market for the time being. Quotations for Fish-Plates of Iron or Steel range from 1.80¢ to 1.90¢; Track Bolts, Square Nuts, 2.70¢ @ 2.75¢; Hexagon Nuts, 2.90¢, Common Iron, and 3¢, Refined; Spikes, 1.95¢ @ 2¢.

**Old Material.**—Old Iron Rails are in good demand, while the supply is very limited. About 2000 tons were secured by a prominent consumer, who claims to have paid only \$22, but other parties bid the same figures and were unable to consummate a purchase, so that this price hardly represents the market at present. Holders are decidedly firm in their views and are looking for considerably higher prices. Inquiries are being received for Old Steel Rails, but no sales are reported. Buyers offer \$17.50. No. 1 Wrought Scrap has been sold along railroad line at \$20 in quite considerable quantities. Among city yards there is less inquiry for No. 1 and little business is being transacted. Buyers offer \$19.50 @ \$20, delivery on cars, and have declined an offer of \$20 to boat. Cast Scrap is dull at \$14.50 @ \$15, while Turnings and Cast Borings are unchanged.

## Financial.

There are some favorable features in the commercial situation, but there is little buoyancy outside of a few special lines. In New York the aggregate of transactions as per clearing-house returns, shows an increase for the week of 20.5 % compared with the same time last year, largely due to speculative activity, not only on the Stock Exchange, but in wheat, coffee and some other commodities, sales of coffee on a single day reaching the colossal aggregate of 124,000 bags under the stimulus of a heavy decline, equal to 2¢  $\frac{1}{2}$  within the last two days. The depression and the excitement incident to it were attributed to a sharp decline of 3½ francs in coffee at Havre, which was influenced by the increased crop estimates for Brazil and the unwillingness of big holders here to carry their load. Wheat dealers, too, were full of business, with prices varying widely. On Monday there was a sharp advance, succeeded by a heavy break, with enormous trading, the largest since last autumn, comprising 24,600,000 bushels. Among dry goods jobbers the only feature of the week is in the return of money buyers from Europe, who report business in all manufacturing centers good, and all seemingly independent of the American market, with higher prices all along the line. The character of the fall trade is not yet determined. Exports of manufactured cottons since January 1 are less than \$4,000,000 in value, against upward of \$5,600,000 for the same time last year. Provisions are easier. Sugar is strong. In the dairy line there are enormous receipts, favored by an exceptionally fine grass season. Crop prospects as a whole are not perceptibly affected by bad weather, and collections are fair.

In the Stock Exchange markets the freight rate troubles in the West, more particularly news that the Chicago and Alton had given notice of an intention to with-

draw from the Interstate Railway Association July 15, were a fruitful source of disturbance. Nevertheless, several of the leading specialties were higher. New England was influenced favorably by prospects of the near completion of the Peekskill bridge, as it is believed that considerable shipments of coal will take the new route, via Lehigh & Hudson to Eastern points. On Friday stocks were dull and lower, the sharpest declines occurring in St. Paul and Burlington and Quincy. New England was again the feature, and closed weak. Saturday brought a dull market, with the coalers firmest on the list, on account of the supposed better prices for anthracite. On Monday the market varied with conflicting reports from the West, but Lead Trust and Sugar Trust attracted much attention, and there was a stronger tone at the close.

On Tuesday there was a little more hopeful feeling at Chicago, it being believed that the Chicago and Alton Railroad cannot substantiate their charges against the St. Paul, and that they will before July 15 take back their notice of withdrawal. The tone of the market was firm to strong. At the annual election of the Oregon Transcontinental and of the Oregon Railway and Navigation companies Mr. Villard carried the Oregon Transcontinental, and a compromise was effected whereby the Oregon Railway and Navigation Company will be managed as part of the Union Pacific system, the Northern Pacific to have nothing to do with it. The new board decided to abandon the proposition to issue \$10,000,000 of preferred stock.

United States bonds were firm. Quotations as follows:

U. S. 4½, 1891, registered.....	106½
U. S. 4½, 1891, coupon.....	106½
U. S. 4, 1907, registered.....	128½
U. S. 4, 1907, coupon.....	129½
U. S. currency 6s.....	118

The weekly statement of the Associated Banks was unexpectedly favorable in showing a decrease in surplus reserves of only \$42,950, due entirely to an increase of \$2,339,800 in net deposits. In loans there was an expansion of \$2,384,400, which was thought to have resulted from the increased activity at the Stock Exchange. The changes indicate receipts of about \$5,000,000 from the interior. In other words, the movement of currency to this center exceeded the outward flow of gold to Europe. The banks still hold \$10,603,225 above legal requirements, against \$28,563,700 a year ago and only \$4,616,625 in the same week of 1887. According to the Custom-House report, the exports of specie from this port during the week amounted to \$4,675,498, making a total since January 1 of \$41,784,818, as compared with \$19,790,000 for the corresponding period last year, and larger than for the same time for any year in the last decade. Imports of specie since January 1 are about \$4,000,000. On Saturday \$4,004,857 was shipped, chiefly to Paris, there being a profit in such transactions owing to the firm tone for Continental exchange. Notwithstanding the heavy gold exports, the monetary situation continued easy and rates were 3 @ 4 % for time loans and 4 @ 5½ % for prime mercantile paper, but the general tone was firmer.

As the season is at hand for the usual semi-annual interest and dividend disbursements, amounting to at least \$65,000,000, the continuance of easy money is looked for with confidence.

The market for sterling was quiet, with posted rates closing at \$4.88 @ \$4.89½. Gold continues to flow into the Bank of England, and the situation, so far as bullion is concerned, promises easy money. A further drain to South America is not improbable.

A phase in Canadian banking that is likely to attract more attention hereafter, namely, the smallness of the cash reserves in proportion to the liabilities, brings out

a cautionary signal in the *Montreal Gazette*, as follows: "The Dominion Government debt payable in London has increased since 1883 from \$130,000,000 to \$196,000,000, or by no less than \$66,000,000, every dollar of which increase was available ultimately through the Canadian banks for the liquidation of mercantile indebtedness in Great Britain, for sinking fund purchases and for the payment of interest on the debt. The annual interest the Dominion has to pay on its debt held in London is now nearly \$2,000,000 more than it was in 1883. It is well known that in imports and exports of merchandise the balance of trade runs against Canada, though not to a large extent, but when to this trade-balance is added the interest upon Government, municipal, railway and other indebtedness, the sum becomes a very formidable one, and only fresh borrowing from time to time has averted a crisis which would expose how much dependency we have upon new drafts of capital for the settlement of foreign indebtedness."

The imports of merchandise at this port during the week were \$8,012,000. Since January 1 the total valuation is \$233,050,000, against \$222,909,000 for the same time in 1888. Exports from this port for the week were valued at \$6,556,000.

Exports of breadstuffs, provisions, cotton and petroleum during May were in value \$32,239,869, against \$28,643,471 in May, 1888. For 11 months ending May 31 the exports of the above-mentioned articles were \$478,703,815, against \$454,543,884. This is a large increase, but the imports have increased to a greater amount. The exports of oils for 11 months of the present fiscal year, as shown by the Treasury report, foot up 554,873,474 gallons, at a value of \$45,158,554, against 530,407,778 gallons, valued at \$42,849,967, for the corresponding period of the year preceding.

A new bank, to be called the Knickerbocker, is soon to be opened on Broadway, near Twenty-eighth street.

## Metal Market.

**Copper.**—At the time of our last report spot Copper stood in London £41. 7/6; it came last night £41. 5/, while futures gave way from £41. 5/ to £41. The statistics of the middle of the month show the visible supply in England and France to have been at the time 114,320 tons, the decrease being 3000 tons for the fortnight, and chiefly in Chili Bars, indicating that consumers over there extend their purchases for the moment to the lower grades. The total sales for the week over there were only 800 tons, however. Here the situation and prices have undergone no change; the mining companies declare themselves satisfied with the deliveries going on to actual consumers, while these insist they are only buying from hand to mouth. There is no change in the quotations, 12¢ being the rule from the producers of Lake direct; in a jobbing way the figure is 12½¢ @ 12¾¢, and casting brands fetch 11¢ @ 11½¢. On the exchange to-day there were no bids; 12¢ was asked.

**Tin.**—On Wednesday of last week London still quoted £90. 17/6 for spot, which dropped to £89. 15/ yesterday. Futures in the meantime declined from £91. 12/6 to £90. 16/. The fact is that the late relatively-high ruling caused a larger output in the producing countries, and the London operators now let the market slide in order to put, if possible, a slight check on the manifest tendency toward overproduction. They may keep prices low for a couple of months, and if then the output relaxes the screws may be put on again. At least this is given out as the programme for the time being. The week's sales in London aggregated 600 tons. Here some



110 tons were first sold on the exchange at 20.20¢, spot and June, and at 20.25¢, September and October; subsequently trading was arrested, the bids not exceeding 20.25¢ for near and 20.15¢ for distant deliveries, the quotation for spot this forenoon being 20½¢ @ 20¼¢. Messrs. Gilfillan, Wood & Co., Singapore, write under date May 9: "Stocks are not large, nor are large supplies expected to arrive in the near future, so that any further decline there may be must take its origin in the consuming markets." Tin closed on the exchange at 19.95¢ bid, and 20.05¢ asked. **Tin Plates.**—Our dealers, who have been holding back their "future" orders are, now that Pig Tin is lower, in hopes of gaining their point, and buying 3d box cheaper than what makers on the other side demand. Meanwhile our market has been dull and unchanged. We quote large lines, ordinary brands, 3d box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Ternes, \$4.12 @ \$4.30; Coke Tins, \$4.22½ @ \$4.32½, and Wasters \$4.12½ @ \$4.15.

**Lead.**—The week has been an excessively dull one, sales in the open market to consumers being restricted to 400 tons at 8.95¢ @ 4¢, the market winding up quite firmly at 8.97½¢ @ 4¢, while St. Louis is strong at 8.80¢ @ 8.85¢ and Chicago at 8.90¢. Closing prices on the exchange today were 8.97½¢ bid and 4.02½¢ asked.

**Spelter.**—There has been a lull, so that we cannot quote Common Domestic on the spot over 5¢, nor Silesian any better than 5½¢. There are no new features, the demand being slack for the moment, but the position of the metal is apparently quite sound.

**Antimony.**—We repeat our quotation of 14¢ for Hallett's and 15½¢ Cookson's, at which there continues to be a steady, moderate consumptive demand.

#### New York Metal Exchange.

The following sales are reported:

THURSDAY, June 13.	
10 tons Tin, spot	20.20¢
20 tons Tin, June	20.20¢
80 tons Lead, August	8.97½¢
FRIDAY, June 14.	
20 tons Tin, October	20.25¢
10 tons Tin, September	20.25¢
10 tons Tin, spot	20.20¢
10 tons Tin, June	20.20¢
50 tons Lead, spot	8.95¢
WEDNESDAY, June 19.	
16 tons Lead, spot	8.97½¢

### Coal Market.

The Anthracite Coal trade is gradually recovering from the effects of the great flood. All but eight of the drowned Reading collieries are again in operation, but the Beech Creek line is not yet restored and several of the laterals of the main lines of railway to the sources of supply are still closed to shipments. The New York market suffers from dullness in the bulk of demand rather than from any shortness of supply, stocks at shipping ports being ample, despite the temporary enforced check in production. Operators profess to believe in renewed activity early in July, and remarks are freely made about another advance in prices, but it is said that the large consumers are not uneasy concerning the prospects. Touching on this subject the Philadelphia Record says that Coal can be bought in that city at concessions from the March circular, and it can be said on authority that the Reading Company have not received one order for Coal this month at the advance made last month. In the Pottsville region at last accounts there was no increase of business and much of the Coal was going into stock. Quotations remain unchanged, viz.: Free Burning,

f.o.b., Broken, \$3.85; Egg Chestnut, \$4; Stove, \$4.80. Reading last week reported 140,000 tons production, of which 80,000 was shipped to Port Richmond and 20,000 to Port Liberty. The Pennsylvania Railroad's Coal tonnage for the year is 4,489,000 tons, a decrease of 691,000 tons compared with 1888.

Bituminous Coal shipments are reported to be more active and the placing of several good mill contracts is referred to. Coal shipments from the Clearfield region were resumed last Sunday, and the daily shipments are from 200 to 300 cars. The Reading Railroad have finished the survey of a branch road from Lofty to Drifton, following the Lehigh Valley most of the way. This road is to carry the Coal from Coxe Bros. & Co.'s collieries at Drifton. Another movement is the organization of the Pennsylvania, Lehigh and Eastern Railroad at Wilkesbarre, with Samuel F. Pierson as president, to run a line from Tomhicken, Pa., to Port Jervis, N. Y., offering a short outlet for hard coal to New England via the Poughkeepsie bridge. The route, as surveyed, will go in close proximity to nearly 50 collieries and through the cream of the Anthracite Coal regions in Luzerne, Carbon, Monroe and Pike counties.

### Imports.

#### Hardware, Machinery, &c.

Boker, Hermann & Co., Arms, cs., 55; Mdee., cs., 4  
Downing, R. F. & Co., Mach'y, pgs., 15  
Frasse, P. A., Mdee., cs., 3  
Foley, Edw., Mach'y, cs., 3  
Folsom, H. & D., Arms Co., Arms, cs., 11  
Hartley & Graham Arms Co., Arms, cs., 22  
Lau, J. H. & Co., Arms, cs., 9  
Merch. Desp. Co., Arms, cs., 12  
Page, Dennis & Co., Mach'y, cee., 1  
Quin, Hugh, Mach'y, cee., 1  
Schoverling, Daly & Gates, Arms, cs., 41  
Seegar & Guernsey Co., Mach'y, pgs., 41  
Singer Mach. Co., Mach'y, cs., 14  
Trovers Bros., Mach'y, pgs., 11  
Weslemann, H., Arms, cs., 16  
Wiebusch & Hilger, Lim., Arms, cs., 28; Hdw., pgs., 12  
Witte, John G. & Bro., Cutlery, cs., 4  
Order: Mach'y, cs., 60; Cylinders, 8; Castings, 16

### British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 19, 1889.

Copper has ruled very irregular, having dropped 20/ and recovered 10/ during the week. Rumors of continued negotiations between the mining officials serve a purpose in supporting the market. The offerings of Merchant-Bar warrants have been larger the past week, and consumers are freely supplied. Dealers have appeared little disposed to purchase. Transactions in furnace material have been on a quite extensive scale, and at somewhat better prices. James Lewis & Sons' record for the first half of the month includes 900 tons Anaconda matte at 8/6, 100 tons Montana at 8/6, 700 tons Montana at 8/3 and 470 tons Montana, private terms, all to arrive, Liverpool delivery. The visible supply of Copper has decreased the past fortnight 4500 tons, and the new supply was 4100 tons less than during the preceding two weeks.

Block Tin receded in price to £89. 15/ on Tuesday under the pressure of heavy selling movement, due to expected large shipments from the Straits. The immediate future of the market depends chiefly upon the extent of those shipments. The current consumption absorbs fully the late average of the supply. To-day prices were very irregular, with sales of prompts at £89. 10/ and £90.

There was a lull in the Tin-Plate market early in the week, but the demand since became quite active and good sales were made of specials. Ternes have been selling quite freely on the basis of 24/ for double boxes. Inquiries are favorable for a continued good business.

Scotch warrants weakened on Wednesday and Thursday last, owing to a pause in the demand that frightened weak holders and encouraged "bear" selling. Since then there has been a recovery, but only a moderate business. Reports from the makers indicate a healthy trade in named brands, but prices are hardly steady. Middlesborough Pig is offered a fraction lower by makers, whose prices are still undersold by merchants. Hematites have ruled very steady, but Spiegeleisen is rather easier.

Common Staffordshire and Welsh Bars are held higher, being in very good demand, but there is no change on other Manufactured Iron. In the Steel trade there is some irregularity, with higher prices asked for Billets, Slabs and Wire-Rods, but some concession made on Steel Rails. A Chilean order for 10,000 tons of Rails, on which British makers competed, was secured by a German firm.

A further improvement in the demand for Old Material and increased purchases of the same are reported.

**Scotch Pig.**—There has been only a fair business and prices show little change. Ocean freights from Glasgow to New York are a shade higher.

No. 1 Coltness, f.o.b. Glasgow	54/6
No. 1 Summerlee, " "	54/
No. 1 Gartsherrie, " "	51/6
No. 1 Langloan, " "	58/
No. 1 Carrbroe, " "	46/6
No. 1 Shotts, " at Leith	52/
No. 1 Glengarnock, " Ardrossan	51/6
No. 1 Dalmellington, " "	45/
No. 1 Eglinton, " "	42/6

Steamer freights, Glasgow to New York, 2/6; Liverpool to New York, 10/.

**Cleveland Pig.**—Business has been moderate and prices are rather weaker. No. 3 Middlesborough quoted 38/ @ 38/6, prompt.

**Bessemer Pig.**—A fairly active business reported at steady prices. West Coast brands, mixed numbers, 49/6, f.o.b. shipping point.

**Spiegeleisen.**—A moderately active trade at somewhat modified prices. English 20 % quoted 80/, f.o.b. at N. W. England shipping point.

**Steel Rails.**—There has been a very good business, but prices are not so strong. Heavy sections quoted at £4. 10/, and light sections £4. 17/6 @ £5. f.o.b. at N. W. England shipping point.

**Steel Blooms.**—A fair demand and the market steady. We quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Makers ask higher prices and there is a fair business. Bessemer, 2½ x 2½ inch, £4. 12/6, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Not much doing, but makers very firm on prices. Bessemer, £4. 12/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—More business doing and the market firmer, without, however, any positive advance. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap-Iron.**—The market quite firm, and more active. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—There is more doing, at firm prices. Bessemer quoted £2. 10/ @ £2. 12/6, f.o.b.

**Tin-Plate.**—A fairly active business, with little change in prices. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	15/3 @ 15/6
IC Bessemer Steel, Coke finish.....	13/6 @ .....
IC Siemens.....	13/9 @ .....
IC Coke, B. V. grade.....	13/ @ .....
Charcoal Terne, Dean grade.....	12/ @ 12/3

**Manufactured Iron.**—The general demand good, and prices firm. We quote, f. o. b. Liverpool:

Staff. Marked Bars.....	£ s. d. @ 8 2 6
Common.....	@ 6 0 0
Staff. Bl'k Sheet, singles.....	7 12 6 @ 7 15 0
Welsh Bars (f.o.b. Wales).....	5 7 6 @ 5 10 0

**Copper.**—The market has been unsettled, but more active than last week. To-day's prices for Bars were £41. 10/; spot; £41 three months' futures. Best Selected, £47.

**Tin.**—Trading has been smaller than last week and the market unsettled. Straits quoted to-day at £89. /10 @ £90, spot, and £90. 2/6 @ £90. /5 for three months' futures.

**Lead.**—The market very quiet but steady. Quoted £12. 10/ for Soft Spanish.

**Spelter.**—A moderate business at unchanged prices. Quoted at £18 for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

Franc, Peseta or Lira.....	Cents. 19.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Milreis (Portugal).....	51.08
Milreis (Brazil).....	54.6
Mark (Germany).....	33.8
Kilogram.....	Pounds 2.205
Picul.....	134.

### EAST INDIES.

**MANILA, June 10, 1889.**—*Hemp.*—The price is nominal at \$15.75 per picul, against \$8 same date last year, equaling \$7 ton, cost and freight, £50, against £27 7/8. Clearances for the United States since last cable amounted to 9000 Bales, against 7000 in 1888. Since January 1 to 118,000, against 88,000; loading for ditto, 13,000, against 11,000; cleared for England since January 1, 120,000, against 144,000; loading for ditto, 8000, against 81,000; cleared for other countries, 19,000, against 38,000; receipts at all ports since last cable, 9000, against 15,000, and since January 1, 267,000 bales, against 273,000 in 1888 and 212,000 in 1887. *Freights.*—\$7.50, against \$5.50. *Exchange.*—Six months' sight, on London, 8/5, against 8/5 1/4. *Kor & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 80 Water street.*

**COLOMBO, Ceylon, May 2, 1889.**—*Plumbago.*—The market has remained firm at ensuing quotations, in rupees, per ton: Large Lump, 145 @ 170; Ordinary Lump, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Following are the shipments made since October 1: To England, 94,157 cwt.; to Hamburg, 6206; to Antwerp, 6007; to Bremen, 659; to Holland, 487; to India, 95; to Australia, 203, and to the United States, 85,951; together, 193,906 cwt., against 148,880 in 1888, 120,123 in 1887 and 110,074 in 1886. *Cot Yarn.*—Nos. 1 @ 4 has been selling at 7 @ 13 rupees per cwt. *Exchange.*—Six months' sight, 1/4 1/4. *Volkart Bros., Ceylon and Malabar Coast, to their agent in New York, Mr. John W. Greens 82 Wall street.*

**PENANG, April 30, 1889.** *Tin.*—Of the fortnight's receipts of 7500 piculs Europeans took 2100 and Chinese 4000. Opening at \$35.00 per picul, the price gave way to \$34.00, at which it closes. The stock demand has caused the stock in bazar to reach 5500 piculs. *Schmidt, Kuster-mann & Co.*

**SINGAPORE, April 30, 1889.** *Tin.*—Some 165 tons have been sold from \$35.75 per picul down to \$35.15 the market closing weak at \$34.80 @ \$34.55. The export hence to England since January 1 amounts to 67,667 piculs, to the United States to 37,202, and to 10,120 to the Continent. *Gum Damar.*—A sale of 30 piculs Palembang was made at \$17.50. *Gum Copal.*—Some 100 to 120 piculs were taken at \$7 @ \$10.75, as to quality. There has been more doing in *Gum Benjamin*, 60 cases fair Padang bringing \$45 @ \$54.50. *Gutta Percha.*—There is no change, but the better sorts are in less request at \$130 @ \$155, while medium fetches \$85 @ \$100. *India Rubber.*—Has been selling at \$45, and Borneo at \$45.50 @ \$46. *Exchange in London, four months' Bank, 3/10 1/4 @ 3/1.*—*Guthrie, Wood & Co.*

### HOLLAND.

**ROTTERDAM, June 6, 1889.** *Tin.*—The production of Billiton for 1888-89—from May 1, 1888, to April 30, 1889—amounts to 73,194 piculs, against

77,840 in 1887-88, 89,122 in 1886-87, 81,032 in 1885-86, 81,367 in 1884-85, 70,974 in 1883-84, 70,061 in 1882-83. The average production during the last ten years is about 76,000 piculs. A public sale of about 12,000 piculs will be held at Batavia on June 27 next. The following statement shows the position of Banca Tin in Holland on May 31, from the official returns published by the Dutch Trading Company:

Import in May, slabs.....	1889. 22,287	1888. 17,797
Total, five months, slabs.....	83,260	108,938
Deliveries in May, slabs.....	9,900	13,146
Total, five months, slabs.....	61,088	89,746
Stock, second hand, slabs.....	38,051	50,809
Unsold stock, slabs.....	149,382	107,223
Total stock, slabs.....	187,433	158,049
Afloat, piculs.....	3,200	.....

### Statement of Billiton.

Import in May, slabs.....	1889. 6,000	1888. 5,000
Total, five months, slabs.....	28,276	46,076
Deliveries in May, slabs.....	8,700	12,670
Total, five months, slabs.....	34,238	23,841
Stock, slabs.....	23,248	32,368
Afloat, piculs.....	19,000	16,500
Quotations, May 31, Banca.....	55 1/4 f.	51 1/4 f.
Quotations, May 31, Billiton.....	56 1/4 f.	51 f.

### Export of Tin from Holland.

	Three months.—		
	1889.	1888.	1887.
	Tons.	Tons.	Tons.
To Germany.....	1,472	1,083	1,516
To England.....	56	28	31
To Belgium.....	232	50	277
To France.....	44	20	96
To Hamburg.....	162	56	174
To the United States.....	128	95	105
To other countries.....	45	12	300

—De Monchy & Havelaar.

### GERMANY.

**HAMBURG, June 8, 1889.**—*Iron.*—Matters in the iron trade have not yet returned to their normal condition. The demand for Pig has increased somewhat; most of the blast-furnaces have, it is true, resumed work, but some only work with half their force. Luxembourg may be quoted 36 @ 38 marks per ton; Westphalian, 40 1/2 @ 42 1/2 for finished iron. A good demand still prevails for Hoops, Beams and Boiler-Plates. Thin Sheets sell swimmingly at the advance established of 15 marks per ton. Machine-shops, foundries and car-shops have been getting on steadily. Wire-Rods are unaltered; they quote them 110 @ 120, and Steel-Rails 120 @ 125. *Metals.*—Have on the whole been well sustained; Lead at 13 @ 13.30 marks per 50 kg.; Spelter at 18 @ 18.50. *Borsenhalles.*

### BELGIUM.

**BRUSSELS, June 8, 1889.**—*Iron.*—Our market has remained very active and firm, with an upward tendency in Merchant Iron, for which there is an increased demand, also for Beams. There is a good run of orders for Structural Iron; only foundries working for the export trade complain of a lack of work. Following are the closing quotations: Pig, Foundry, 5.20 @ 6.50 francs per 100 kg.; Forge, 4.80 @ 5.50; Merchant, No. 1, 12 @ 12.50; Beams, 11.75 @ 12; Sheet Iron, 16 @ 25; Steel, ditto, 18.50 @ 19.50. *Monteur des Interets Matériels.*

Samuel Untermyer, the agent for the English syndicate which is purchasing American breweries, said to a reporter in this city on Tuesday: "This syndicate, which, by the way, is not a syndicate, but merely a number of English capitalists, is going to invest in flour-mills and rolling-mills. We are already negotiating for the purchase of different mills, and propose to manufacture steel rails in this country. I am not at liberty now, however, to state where these manufactories and mills are."

The latest estimate of the railroad mileage of the world is given in a German periodical. The conclusion is that there are 324,400 miles of railroad in existence, in which \$26,500,000,000 is invested. The capital in Europe is \$118,000 per mile and in other countries \$59,000. Nearly one-fourth of the mileage of the railroads of the world has been constructed during the last four years. This country leads all others in the amount of mileage, which is placed at 150,700, a low estimate. Of the European countries Germany leads with 24,900 miles and France, England, Austria and Russia come next in the order named, the latter reporting 18,000 miles. In British India there are 14,200 miles of road; in Cape Colony, 1700 miles; in Brazil, 5000 miles; in the Argentine Republic, 4000 miles; and in all the Australian provinces 9500 miles. Railroad-building is going on very fast in South and Central America, Australia, Japan and in Natal and Mauritius in Africa.

### Bituminous Coal Production.

The Seaboard Steam Coal Association of bituminous coal producers, organized to maintain pool prices, has met with but indifferent success from its inability to enforce its own rules and regulations. At scarcely any time have the prices officially announced more than approximated the prices actually ruling. The Philadelphia *Record* predicts that this year will witness the disruption of the whole concern. "There is no longer any doubt of that among soft-coal shippers by reason of its utter worthlessness and weakness. At the beginning of this year iron-bound articles were signed, to which all the larger operators were induced to subscribe. The prices were fixed for coal shipped to the East from each of the Atlantic ports, and stringent regulations provided for a deposit by each shipper for every ton shipped as a guarantee that he would live up to the terms of the agreement. There is not one of the provisions but has been utterly disregarded. Prices have been slashed by the larger operators, and the smaller men have followed as best they could. The deposit of 20 cents on each ton mined has proved a manifest absurdity, as was prophesied at the start, and the Steam Coal Association has no excuse for existence." The reasons given for this situation are that "there is too much soft coal seeking a market to make any agreement for restriction possible. There is hardly one of the bituminous districts but can largely increase its output if occasion demands or if the smallest profit can be derived. At the Western part of the Clearfield region there are new developments of considerable size, but in the Southern regions almost an indefinite amount of coal can be mined. In the Pocahontas region of Virginia and West Virginia and in the Elk Garden region of West Virginia there are immense deposits of coal not yet touched. With conditions such as these, with an innumerable number of competitors trying to increase their tonnage, the effort at restriction is absurd and has signally failed."

**A Simple Boring Test.**—The question of simple methods of investigating the ground underlying foundations has been lately discussed in *Engineering News*. The latest method suggested for borings of moderate depths comes from a correspondent signing himself "Buckeye." He says he has frequently used for this purpose the following simple method: Take a worn-out locomotive boiler flue, and cut slots about 1/4 x 6 inches in a spiral winding around the flue. Then sharpen one end of the flue to a cutting-edge and put a heavy screw-cap on the other end. This cap should be not less than 3 inches long and solid for 2 inches of its length. In using this testing apparatus drive the flue down with a heavy sledge and at the same time turn the pipe with a large chain-tongs. The pipe can be lifted again by a lever or a derrick of portable form. When the tube is withdrawn the character of the material penetrated can be examined through the slots in the sides. A locomotive boiler-flue is generally about 11 feet long, but this is usually sufficient to test the foundations of small bridges and other light structures.

A fleet of small twin-screw boats, propelled by electricity, will run on the Thames River, England, this summer. They will transport passengers from place to place over short distances. The electricity is to be generated from accumulators carried on the boats and recharged when necessary at any of the river stations. The boats are 65 feet long, 22-inch draft and carry 80 passengers.

## Hardware.

While in some respects the business of the half-year now closing has not come up to expectations, a review of the trade shows that on the whole it has been reasonably satisfactory. Many manufacturers have been fully occupied on orders, and the volume of business has been large. The margins of profit have in many lines been narrow, and there has been some disposition on the part of some to sell goods at a positive loss. There are, however, indications that manufacturers are recognizing the necessity of refusing unremunerative business, and if this were generally done it would greatly improve the situation.

### Cut Nails.

The sales of the past week have been quite large in the aggregate, much of the business having been unsolicited. Inquiries are evidently being stimulated by the disposition of dealers to advance prices. The market is in quite a feverish and unsettled condition. Some of the leading houses have already pushed their quotations up a notch or two, and the others are selling very cautiously, with a watchful eye on their stocks. Shipments of Nails from the factories in the recently flooded districts of Pennsylvania are still being interfered with, so that it is difficult to arrange definitely for the future. Dealers are quoting on inquiries for immediate acceptance only. The Oxford Iron and Nail Company's price is now \$2, but the other houses are still naming \$1.80 @ \$1.90, with sales at about \$1.85 on an average. Cheap stocks seem to have been pretty well cleaned up by this time, and the market is in much better shape for an advance than for a long while.

The regular monthly meeting of the Western Cut Nail Manufacturers' Association was held in Wheeling, W. Va., on Wednesday, the 12th inst. No agreement whatever was reached looking either to a curtailment of production or a change in selling price. The Jefferson Iron Works, of Steubenville, Ohio, gave notice of their withdrawal from the organization. An effort was made to reduce the so-called extras on the list and reduce them all along the line, with a view of checking the demoralization caused by what are known as the "averages," which are calculated by each mill for itself. Pending a discussion on the subject a motion to adjourn was carried. The impression prevails that the association has been practically dissolved and will not hold another meeting.

From Chicago we have the following advices from a most reliable source: "The failure of the members of the Western Cut Nail Association to reach an amicable settlement in regard to prices and product at their meeting on the 12th inst. is likely to result in a demoralized market for some time to come. The prices at which some of the manufacturers unloaded large blocks of Nails into the hands of leading Western jobbers within the last few weeks is regarded by many as having placed the jobbers in control of the market price for several months. The manufacturer who did not sell at the extreme prices then prevailing now finds himself with a stock on hand which he cannot well dispose of to the jobbers, and he must find other purchasers or stop his factory. In endeavoring to release himself from this predicament, the only avenue of escape appears to be through the retailers. Under these circumstances, from what has already developed, it will not be surprising to hear that certain manufacturers are soliciting carload orders from the retailers through the West at figures scarcely higher than those at which

the jobber purchased in large lots of 3000 to 5000 kegs. Competing railroad lines are fighting for business, and Nails are apparently made leaders in the cut rate. June 8 the rate from Wheeling and Pittsburgh to Chicago was fixed at 11 cents per keg. On the 11th this rate was reduced to 9½ cents, and on shipments through to St. Paul 17½ cents. It may be argued that this will help the manufacturers out on the low prices previously made, but at the same time it will place in the hands of the mills the power to stock up the Western retailer, so that the jobber will be forced to sacrifice the advantages of his low prices or carry his stock. The Chicago jobber does not often allow anybody to get away with him, and in the conflict between the manufacturer and the middleman the retailer may reap the harvest."

### Wire Nails.

Some opposition to the new card, June 1, is still manifested, and the Tack manufacturers are still using their former lists, and some other concerns—as, for example, the Wire Goods Company, Worcester, Mass.; American Screw Company, Providence, R. I., and Russell & Irwin Mfg. Company, New York—have not adopted the part relating to the papered goods, though it is not unlikely that they may decide to do so. There is also some opposition to the new list on the part of some of the jobbers, who regard it as impracticable to apply the card to such goods. The irregularity which results from the use of different lists is annoying to both buyer and seller, as the former will naturally closely scrutinize the prices of the different manufacturers, and buy the goods from the card or the list according as will be to his advantage, in many cases perhaps dividing the orders. The difficulty which is experienced in regard to special Nails which are not covered by the new card is also referred to. On the whole, however, the new card seems to be generally received with favor, and if it continues to be adhered to by the principal manufacturers will probably in time be adopted by most of the others, and its tendency will be to diminish the number of sizes which will be called for by the trade. It may, however, be some time before the papered goods are generally sold on the new system.

Comparatively little business has been done since the announcement of the new card, and manufacturers generally are busy filling orders at the old prices. The indications are that a base price of \$2.25 to \$2.30 for carload lots at factory about represents the market, with comparatively slight advances for less than carloads.

### How It Looks in the Country.

Scene—Hardware store. Time—June 10, 1889.

Dramatis Personæ—Hardware Man and Average Customer.

H. M.—Good-morning, sir.

A. C.—Howdy. What can you sell me Wire Nails for, Mr. Hardware Man? I shall build a house and barn this season—have the foundations already laid—and shall want a good bit of Hardware. Now, make the figures low.

H. M.—Well, Average, you have always been inclined to favor me in the way of patronage, and I will make the price \$2.50, base, provided you give me all of your trade in Hardware for these buildings.

A. C.—Two dollars and fifty cents, base! I suppose that means 2½ cents per pound for what Wire Nails I want.

H. M.—No, sir. That would average less than cost. We can't do that; shall be obliged to charge you the regular mill extras.

A. C.—Well, how much will that make Shingle Nails cost me?

H. M.—Three dollars and forty cents per keg.

A. C.—That ain't bad. I shall want mostly 10d and 12d.

H. M.—The list of extras has just been changed. We shall have to charge you 40 cents extra for 10d and 35 cents for 12d.

A. C.—You don't say! Well, I suppose I shall have to stand it. I shall want some 30d and 40d for the rafters and frame and a part of a keg of Lath Nails.

H. M.—According to the new list I shall have to charge you 20 cents extra for 30d and 40d Nails.

A. C.—What do you mean? What is the base, anyway?

H. M.—Sixty-pennys.

A. C.—Thunderation! I don't want any 60d. What are you giving us, anyway? Do you claim to sell me Wire Nails for \$2.50 per keg and then charge me \$2.70 for the cheapest size that I want? What do you take me for? I always supposed that you were an honest man for a Hardware dealer, but this is the most bare-faced swindle I have ever heard of in this country.

(Exit A. C.—Enter Carpenter Builder.)

C. B.—How are you, Mr. Hardware Man? How is the Wire Nail market?

H. M.—So-so. Have you heard of the change in extras?

C. B.—Change! Have they changed it again so quick, and what for?

H. M.—Oh, the base is now 60d, with 10 cents extra for 50d, and so on, to 50 cents for 8d and 9d; then only 65 cents for 6d and 90 cents for 4s. They say that this change is necessary to make the list symmetrical, and that as at present arranged they can accept an order for any size without requiring a customer to take a certain number of kegs of small sizes to increase the average price. But here is the new card, together with the manufacturer's circular. Look them over.

C. B. (after a few moments' study)—Now, what are we to expect? We were told last year that it was necessary, in order to accept orders of the kind you name, that 60d should be sold for 35 cents more than 12d. They changed the list to obviate this difficulty and to make the list "symmetrical." Eleven months later, in order to harmonize that list, we are told that it is necessary to charge 35 cents per keg more for 12d than for 60d. This strikes me to be very like "Young America" or else there is a "nigger in the bushes." Of the two I am inclined to think that it is the "nigger." Next year they will discover that kegs cost money and charge 10 cents extra for them. In 1891 it will be found necessary to charge 2 per cent. extra on the whole card to cover insurance, and in 1892, it being the national election, they must add 5 per cent. for political "soap." If they want a "base" to reckon from, why not make it \$1 per keg? Then you can sell Wire Nails cheap (until you add the extras). We are told that these goods are being sold "very close; very close, sir;" "losing money every day, sir." Why don't they charge 10 cents extra for 60d and make a profit, instead of staggering along in this way? It must be that these Wire-Nail maker will all be in the poor-house very soon. But, Mr. Hardware, think of it a moments! Why, man alive! it is worse than European hotels, where tourists are charged extra for soap and candles.

H. M.—Don't be too hasty, friend Builder! By this arrangement you not only buy penny nails on this base, but also all Wire Nails, either in boxes or in pound papers. Don't you see the beauty of it?

C. B. (after a moment's thought)—Why, yes; to be sure! Don't know but I shall like that, friend Hardware Man. You will hang up a list of extras for your clerks to sell by, and when I come in to buy, say, 10 pounds ¼ No. 19 finishing, your

clerk will look up the list, and seeing that size down for \$6 I shall get my 10 pounds for 60 cents and save my "base." That's good! I have no more to say. I take it all back. The manufacturers were wise beyond their years. Good-day, sir.

MASSACHUSETTS.

### Export Trade.

The demand for all classes of American merchandise continues good from the Argentine Republic, and there is every prospect of a continuance for some time. The few houses here doing that business report heavy shipments and large orders are yet in hand not placed. As long as the extraordinary immigration to that country continues and no internal trouble occurs business will be good. The west-coast trade remains very dull and is in the hands of a few large houses who have secured the cream of the business. Latest reports from South Africa show good business, notwithstanding the fact that buyers have undoubtedly been overloading, extraordinarily heavy shipments being made of Carriages and Manufactured Wood Goods, as well as all kinds of general merchandise.

The Australian mail, which arrived in installments on Saturday, we regret to say does not seem to be up to the standard, and freighters will continue to fill their vessels at probably a loss. A few of the representative merchants from the colonies are here, but are doing little or nothing in the way of making purchases; all complain of excessive freight charges and are holding back their purchases on this account. We learn that a new line of vessels to the colonies will be established when a favorable time arrives, as the capital has been subscribed; managers are only waiting for the time to arrive when money can be made or a fight instituted that in the end will be successful. There are rumors of trust combinations, &c., by some of the manufacturers engaged in the export business for the purpose of realizing a profit on their goods, but nothing definite has come of it yet.

More attention should be given by our manufacturers to packing goods for export. This is a very serious question. We should bear in mind that the freight is a very important item and importers will not pay freight on rubbish. Cases should be made to exactly take in the goods without leaving spare room. Another feature which needs attention is the packing of polished-steel goods, such as Shovels, Axes, Hammers, Agricultural Implements, &c. The vessels to South Africa, New Zealand and portions of Australia are small and apt to be wet; if goods arrive out rusty dealers lose money and will place orders with firms who pack in waterproof paper, or who use some preventive against rust. We are on the eve of a very large export trade, and manufacturers now engaged with the business should give careful attention to these points in order to hold what they have and be in a position to reap the reward which awaits them in the future.

### Miscellaneous Prices.

The regular monthly meeting of the Wrought-Iron Pipe and Boiler Tube Manufacturers' Association was held in the Monongahela House, Pittsburgh, on Thursday, the 13th inst. Campbell B. Herron, chairman of the association, presided and J. B. Murdoch acted as secretary. The following named firms were represented in person:

National Tube Works Company, Pittsburgh.  
Pennsylvania Tube Company, Pittsburgh.  
Spang, Chalfant & Co., Pittsburgh.  
A. M. Byers & Co., Pittsburgh.  
Duquesne Tube Company, Pittsburgh.  
Morris, Tasker & Co., Philadelphia.  
Conshohocken Tube Co., Conshohocken, Pa.  
Am. Tube and Iron Co., Middletown, Pa.  
Oil City Tube Company, Oil City, Pa.  
Riverside Iron Works, Wheeling, W. Va.

After a long discussion on the condition of trade and the advisability of advancing prices it was decided to make a slight advance only on 8, 4, 6 and 8 inch Line-Pipe. The following discounts and prices were agreed on and went into effect on Saturday, the 15th inst.

	Discount.
Butt-Welded Pipe	52 1/2 %
Lap-Welded Pipe	50 %
Butt-Welded Pipe (Galvanized)	48 %
Lap-Welded Pipe (Galvanized)	52 1/2 %
Casing, 5 1/2 inches	52 1/2 %
All other sizes	50 %
Boiler Tubes, 1 1/2 inches and smaller	58 %
Boiler Tubes, 2 inches and larger	60 %
2 1/2-inch Line-Pipe, per foot, net	\$0.18
3-inch Line-Pipe, per foot, net	0.21
3 1/2-inch Line-Pipe, per foot, net	25
4-inch Line-Pipe, per foot, net	30
5-inch Line-Pipe, per foot, net	48
6-inch Line-Pipe, per foot, net	58
7-inch Line-Pipe, per foot, net	70
8-inch Line-Pipe, per foot, net	85
9-inch Line-Pipe, per foot, net	1.20
10-inch Line-Pipe, per foot, net	1.25
12-inch Line-Pipe, per foot, net	1.60

The next meeting of the association will be held at Long Branch about the middle of July.

The Tack market has not recently experienced much change in its general features. Prices are very irregular, and there is little reason to doubt that a good many goods are sold without profit. The more conservative houses are declining to meet the extreme quotations, preferring to lose orders rather than accept them at unprofitable figures, but the margin of profit even with the most conservative management is conceded to be small. There is also a good deal of irregularity in regard to the weights of Tacks, and the many new forms in which the goods are put on the market add to the general confusion, so that unless one carefully scrutinizes the goods he cannot be sure of what he is getting. There is also a lamentable laxity in regard to the quantity of goods in given packages, and buyers will be wise to examine carefully the weight, number, &c., of all goods they are buying.

The prices of Strap and T Hinges do not improve, and there has been recently a further decline in quotations made, especially by the Western manufacturers. Some of the Eastern manufacturers are pursuing a more conservative policy, but their quotations also show a downward tendency. Wrought Butts are in similar condition, but the demoralization has not proceeded quite so far.

Boxwood Rules do not show evidences of improvement, but there has been recently a further slight decline in prices.

The Pick and Mattock Makers' Association held their semi-annual meeting in Pittsburgh on June 6. The meeting was very harmonious and satisfactory, the only changes made being a moderate advance in price of Picks, Mattocks and Grub-Hoes, the trade prices being established at 50, 10 and 5 to 60 per cent. off list. We are advised that all the manufacturers of these goods in the country are members of this association.

The following discounts are named by the Cincinnati Tool Company, Cincinnati, Ohio, relating to the line of good they are offering to the trade:

	Discount.
Sets of Taps and Dies	15 & 10
Bench Stops	25 & 10
Washer-Cutters	25 & 10
Spoke-Shaves	25 & 10
Combination Drawer Locks	25 & 10
Screw-Drivers	20 & 10
Brace Screw-Drivers	25 & 10
New Pattern Folding Screw-Driver, 6-inch, \$3; 7-inch, \$4	net
Adjustable Bench-Clamps	20 & 10
Machinists' Clamps	15 & 10
Adjustable Screw-Clamps	15 & 10
Adjustable Boat and Ship Clamps	15 & 10
Quilt-Clamps	25 & 10
Cabinet-Clamps	25 & 10
Carpenters' Clamps	25
Extra-Heavy Carpenter's Clamps	25
Standard Clamps	15 & 10
Cabinet-Maker's Clamps	15 & 10
Adjustable Ship and Bridge Builders' Clamps	15 & 10

Cooper's Shaves	20
Box-Scrappers	25
Band-Setters	25
Gimlets	25
Brad-Awls	20
Brace-Wrenches	15 & 10
Monkey-Wrenches	15 & 10
Countersinks	25
Plug-Cutters	20
Spoke-Pointers	25
Bit-Gauge	25
Dowel-Pointer	25
Door-Hangers Nos. 3 and 4, Improved	25 & 10
Brace-Drills	30 & 5
Brace-Drills for Metal	40 & 10
Cutting-Nippers	25 & 10
Screw and Plug Bit	25
Saw-Vises, Nos. 3 and 4	20 & 10
Standard Hollow Auger	25 & 10
Adjustable Hollow Auger, No. 1	30 & 30 & 5

### Items.

Buffalo Hammer Company, Buffalo, N. Y., have issued a new illustrated price-list and catalogue of their extensive line of solid-steel Tools. It represents an exceptionally complete assortment of Handled and other Hammers, Picks, Hot and Cold Chisels, Swages, Punches, Hardie's Flat-ters, &c., as well as a line of Hatchets. The company call attention to the fact that they are now located in their new works, with largely increased facilities, and are prepared to manufacture a high grade of tools. For the convenience of the trade they have adopted a new system of numbers on Hammers, doing away with all duplication, so that Hammers and Sledges can hereafter be ordered by number only, no further description being necessary. The association list and numbers are used on Hatchets. The catalogue is fully illustrated and finely printed.

The new catalogue of Hubbard & Co., Pittsburgh and Beaver Falls, Pa., is a beautiful specimen of artistic printing, and shows very satisfactorily the extensive line of goods represented in it. It is the work of Gies & Co., engravers and printers, Buffalo, N. Y., whose taste and skill are exhibited on every page. The catalogue is divided into the following departments: Axes, Saws, Shovels, Spades, Scoops and Drain Tools, Railroad Supplies and Eye Hoes. It is copiously illustrated with cuts exceptionally fine, and the different patterns of Axes are shown in *fac-simile*, colors of labels, &c., being accurately reproduced. Side and edge views of the different Axes are given. In some of the cuts the edge and poll are given, also the swell or ridge on the center of the blade, thus showing not only the exact shape but the thickness of the head or poll of each Axe. The effect produced by the gold bronze and the striking colors is very attractive and the brilliant corner-piece on each page adds materially to the beauty of the book. In the different departments there are copious illustrations showing the patterns of the different goods. It is worthy of notice that each of the divisions of the book is preceded by a sheet for quotations on the line of goods in the division which follows, so that the prices are thus given in close connection with the goods to which they relate, instead of being, as usual, at the beginning or ending of the book, or in a separate sheet. It is also suggested to the customers of the house that the book as sent be not mutilated, and it is stated that loose pages printed on one side only for the use of salesmen will be furnished on application. This catalogue, which has been not inappropriately referred to as the finest catalogue in the trade, will be valued by those who receive it, and bears evidence of the enterprise of the house that issues it.

Walter W. Woodruff & Sons, Mount Carmel, Conn., have issued a new catalogue illustrating their line of Carriage Hardware and other manufactures, their Mount Carmel Ox Shoes being prominently represented. The catalogue is excellently printed on fine paper. Special attention is directed to the large assortment of special band patterns. They also allude



to their new special process of electroplating, combining the use of nickel as a base with a heavy coating of silver. This catalogue will be received with interest as covering a desirable line of goods and evidencing the progress and enterprise of the house.

Announcement is made under date June 1 that the copartnership heretofore existing between A. E. La Tour, Emil Jetter and Edward Jetter, Buffalo, N. Y., under the firm name of the Jetter Mfg. Company, has been dissolved by mutual consent. The business will be carried on under the same firm name by Emil Jetter and Edward Jetter, A. E. La Tour having retired from the firm.

The Henry Sears Company, 75 and 77 Wabash avenue, Chicago, Ill., issue a comprehensive 50-page price-current illustrating an extensive line of Cutlery, including Table and Pocket Scissors and some specialties. A great many illustrations are given, with list prices.

De Grauw, Aymar & Co., 84 and 85 South street, New York, are issuing a handsome illustrated catalogue and price-list which relates to Cordage, Oakum, Wire Rope, Chains, Anchors, Oars, Blocks and Cotton and Flax Ducks, Russia Bolt Rope, Bunting, Flags, Marine Hardware and Ship-Chandlers' Goods generally. It is neatly printed and well arranged.

Sargent & Co., New Haven, Conn., and New York, issue a number of new pages for insertion in their 1888 catalogue. They refer to their line of Locks, Knobs, Door Furniture, &c., and include also some new Hooks, Sash-Lifts, Transom-Lifters, Scandinavian Padlocks and the present Screw list.

The Hollow Cable Mfg. Company, Hornellsville, N. Y., report that they are enjoying a good trade in their line of goods, namely: Preston's Patent Hollow-Cable Clothes-Lines, Braided Barbliss Fence Wire and Braided Box Bands. Their Fence-Wire trade is alluded to as active and increasing, the Wire being regarded with especial favor by breeders of fine stock, making as it does a strong, light and cheap fence which is not liable to break in cold weather from contraction.

### Obituary.

J. B. Shannon, well known to the Hardware trade as senior member of the firm of J. B. Shannon & Sons, Philadelphia, Pa., died in that city on June 9 at the advanced age of 71 years. Mr. Shannon was among the early Hardware men, being in the store of Peter Rodgers, and in 1846 became a member of the then new firm of Little, Hatrick & Shannon, all former employees of Peter Rodgers, this firm being shortly afterward succeeded by Little & Shannon, and again in 1854 by J. B. Shannon. From 1858 to 1884 he was located at 1009 Market street, and then moved to the present site, a large five-story building, 1020 Market street, and on July 1, 1878, took into the firm three of his sons—Alfred P., Edwin H. and David W.—under the present style of J. B. Shannon & Sons. Mr. Shannon was always of an inventive turn of mind, and has devised many useful articles for the hardware and building trades, but realized nothing from his inventions, as none were ever patented. He was the first in the United States to use electrical annunciators in hotels, and among the first to make gas-burners in this country. The sliding-roller door originated with him, which, by the way, was an accident, not an invention. As a business man Mr. Shannon stood high in the estimation of the community and was sincere and devoted to many interests in his city, and was one of the most active and energetic men of his time.

### Relief for the Johnstown District.

The following is a further list of contributors to the relief fund for the sufferers by the flood in the Conemaugh Valley, the contributions below being secured by Geo. V. Smith, sales agent Cambria Iron Company (Gautier Steel Department,) 104 Reade street, New York:

Dunham, Carrigan & Hayden Co. and employees, New York.....	\$162.00
S. Otis Livingston, New York.....	100.00
David Williams, New York.....	100.00
Vought & Williams, New York.....	100.00
Huntington, Hopkins Co., New York.....	100.00
Wm. Jessop & Sons, Ltd., New York.....	100.00
W. H. Wallace & Co., New York.....	100.00
D. G. Gautier & Co., New York.....	100.00
Egleston Bros. & Co., New York.....	100.00
Mrs. C. D. Carpenter, New York.....	100.00
H. W. Johns Mfg. Co., New York.....	100.00
Penn & Lee, Syracuse, N. Y.....	100.00
Cortland Wagon Co., Cortland, N. Y.....	100.00
Fowler Nail Co., Seymour, Conn.....	100.00
Pierson & Co., New York.....	100.00
Richardson Mfg. Co., Worcester, Mass.....	100.00
Bellows & Manson, Boston, Mass.....	100.00
H. L. Hoyt & Co., Victoria Hotel, New York.....	100.00
Thomas F. Russell (Gautier Steel Department, 104 Reade street).....	100.00
Geo. V. Smith (Gautier Steel Department, 104 Reade street).....	100.00
Reformed Church, Greenpoint, L. I.....	86.50
F. W. Wurster & Co.'s employees, Brooklyn, N. Y.....	52.25
J. C. McCarty & Co., New York.....	50.00
John H. Graham & Co., New York.....	50.00
Gilbert, Sweet & Lyon, New York.....	50.00
J. J. Richards & Co., New York.....	50.00
Abeel Bros., New York.....	50.00
Horace Dennitt, New York.....	50.00
American Mfg. Co., New York.....	50.00
F. W. Wurster & Co., Brooklyn, N. Y.....	50.00
C. H. Tiebout & Sons, Brooklyn, N. Y.....	50.00
Boutwell Bros., Lowell, Mass.....	50.00
Jas. W. Eager and W. H. Niven, Syracuse, N. Y.....	50.00
Howe & Co., Troy, N. Y.....	50.00
J. Thomson & Bro., New Orleans, La.....	50.00
Employees of H. W. Johns Mfg. Co., New York.....	40.00
Employees of John H. Graham & Co., New York.....	38.50
Hogan & Son, New York.....	25.00
Smith, Lyon & Field, New York.....	25.00
Henry B. Newhall, New York.....	25.00
Heller Bros., Newark, N. J.....	25.00
W. H. H. Sium, Brooklyn, N. Y.....	25.00
Nelson & Call, Cortland, N. Y.....	25.00
Winter & Ball Mfg. Co., Jersey City, N. J.....	25.00
Thompson Bros., Malone, N. Y.....	25.00
W. W. Conde, Watertown, N. Y.....	25.00
D. & G. Delany, Newark, N. J.....	25.00
Merriam Bros., Waverly, N. Y.....	25.00
J. S. Crane & Co., Newark, N. J.....	25.00
Southington Cutlery Co., Southington, Conn.....	25.00
F. A. Houdiette & Co., Boston, Mass.....	25.00
H. C. Marshall, New York.....	25.00
W. Eddy & Sons, Greenwich, N. Y.....	25.00
Wm. H. Field, Port Chester, N. Y.....	25.00
Ed. Schedler, New York.....	10.00
C. Romaine, New York.....	10.00
Cash, New York.....	10.00
W. E. Pruden, New York.....	10.00
Matthew J. Nunan, New York.....	10.00
E. Winsor & Co., Providence, R. I.....	10.00
Beals & Brown, Buffalo, N. Y.....	10.00
C. W. Palmer & Co., Herkimer, N. Y.....	10.00
Bacon & Co., Boston, Mass.....	10.00
McBarron & Maxwell, Boston, Mass.....	10.00
L. S. Winne & Co., Kingston, N. Y.....	10.00
Employees of Sahler, Reynolds & Webster, Rondout, N. Y.....	10.00
Terry Mfg. Co., Horseheads, N. Y.....	10.00
W. H. Wild, Valatie, N. Y.....	10.00
Geo. Sweet & Co., Dansville, N. Y.....	10.00
F. Alexander & Co., Staunton, Va.....	10.00
Cash, New York.....	5.00
Lewin & Goodnoe, Schenectady, N. Y.....	5.00
F. R. Stout, New Brunswick, N. J.....	5.00
Cortland Mfg. Co., Ltd., Cortland, N. Y.....	5.00
John Merkle, Jr., Newark, N. J.....	5.00
A friend.....	1.00
<b>Total.....</b>	<b>\$3,535.25</b>

The following is the list of contributions by the Hardware and Iron merchants of Chicago for the relief of the sufferers in the Conemaugh Valley:

O. W. Potter, Illinois Steel Co. (sent direct).....	\$500.00
Frazer & Chalmers.....	500.00
Crane Bros. Mfg. Co.....	500.00
John Crerar, Crerar, Adams & Co.....	500.00
Frazer & Chalmers' employees.....	304.15

Hibbard, Spencer, Bartlett & Co.....	\$250.00
Adams & Westlake Co.....	250.00
Thomson Electric Co.'s employees.....	212.50
J. T. Ryerson & Son.....	200.00
Link Belt Machinery Co.....	200.00
David Bradley Mfg. Co.....	200.00
E. W. Blatchford & Co.....	150.00
National Tube Works.....	100.00
W. S. Mallory & Co.....	100.00
A. Plamondon Mfg. Co.....	100.00
Ames Iron Works, Chicago branch.....	100.00
Horton, Gilmore, McWilliams & Co.....	100.00
Markley Alling & Co.....	100.00
A. F. Seeberger & Co.....	100.00
Gates Iron Works.....	100.00
Jas. B. Clow & Son.....	100.00
Pickands, Brown & Co.....	100.00
Baker, Smith & Co.....	100.00
Raymond Lead Co.....	100.00
C. Sidney Shepard & Co.....	100.00
Gormully & Jeffrey Mfg. Co.....	100.00
J. A. Fay & Co.....	100.00
Norton Bros.....	100.00
Wells, French & Co.....	100.00
Chicago Malleable Iron Co.....	100.00
M. Benner & Co.....	75.00
Western Electric Co.'s employees.....	60.00
M. C. Bullock Mfg. Co.'s employees.....	57.00
Chicago Screw Co.'s employees.....	60.00
J. J. Glesner.....	50.00
Chicago Stamping Co.....	50.00
Fairbanks, Morse & Co.....	50.00
J. F. Wollensak.....	50.00
Goulds, Austin & Caldwell.....	50.00
M. Greenbaum's Sons.....	50.00
M. C. Bullock Mfg. Co.....	50.00
C. H. Beasley & Co.....	50.00
Wells & Nelligar.....	50.00
Chicago Rubber Works.....	50.00
Moorhead, McCleane Co.....	35.00
Holmes, Pyott & Co.....	25.00
A. J. Kirkwood & Co.....	25.00
Vaughan & Bushnell Mfg. Co.....	25.00
National Boiler Works.....	25.00
Chas. Elms.....	25.00
J. A. Miller & Bro.....	25.00
H. Rendtorff & Co.....	25.00
Lalanc & Grosjean Mfg. Co.....	25.00
Kellogg, Johnson & Bliss.....	25.00
C. H. Gurney & Co.....	25.00
S. J. Surdam & Co.....	25.00
E. Hunt's Sons.....	25.00
N. B. Williams.....	25.00
Morietta Iron Works.....	25.00
E. Baggott.....	25.00
Mortimer McRoberts.....	25.00
Chicago Scale Co.....	25.00
Orr & Lockett.....	25.00
Electric Supply Co.....	25.00
Chicago Raw-Hide Mfg. Co.....	25.00
Curtis & Co.....	25.00
Anson Sperry.....	25.00
Borden, Belleck & Co.....	25.00
Cutler, Woodrough & Co.....	25.00
Gilbert & Bennett Mfg. Co.....	25.00
Clinton Wire Cloth Co.....	25.00
King & Andrews Co.....	25.00
Harrington & King Perforating Co.....	25.00
Chicago Hardware Mfg. Co.....	25.00
Vulcan Iron Works.....	20.00
John Davis Co.....	20.00
Chicago Spring Butt Co.....	10.00
Dennison & Hamilton.....	10.00
Scoville Mfg. Co.....	10.00
Kieckhefer, Bartling & Co.....	10.00
Illinois Wire Nail Co.....	10.00
Taunton Tack Co.....	5.00

Charles M. Biddle, treasurer of the Philadelphia Hardware Relief Fund for the Johnstown sufferers, reports the following additional subscriptions:

I. B. Seeley.....	\$5.00
American Machine Co.....	100.00
Employees American Machine Co.....	79.00
Charles R. Ruchener.....	5.00
Mrs. S. F. Midwinter, Oceanic, N. J.....	10.00
Palmer Street School.....	.17
Wm. Rose & Bro.....	32.00
Ensign, Bickford & Co., Simsbury, Conn.....	100.00
Employees Job T. Pugh.....	9.50
De Witt, Morrison & Kelley.....	30.00

The entire amount thus contributed is reported as follows:

Through Drexel & Co.....	\$3,274.00
Through Jobbers' Committee.....	3,164.25
Through Manufacturers' Committee.....	3,002.91
Through Retailers' Committee.....	966.72

**Total.....\$10,407.88**

### Hardware Interests at Williamsport, Pa.

While the well-nigh unparalleled disaster in the Conemaugh Valley has to a large degree engrossed public attention, the destruction of life and property at Williamsport, Pa., has not received the appreciation that it would otherwise have had; but its merchants as well as others

have been overtaken by a calamity which, besides the destruction of life and property, disturbs the regular order of business and may call for indulgence on the part of their creditors. Having 7½ or 8 feet of water on the floor of a Hardware store, while logs by the million feet and houses by the dozen are swept by the door, has a disquieting and damaging effect upon trade. In view of the unsettled condition of things and the disturbance of business, the Hardware merchants of the city have been conferring; and while efforts are being made as quickly as possible to return things to their normal course, and to carry on trade as before, the following circular letter has been addressed to wholesale dealers and manufacturers of Hardware and all other goods sold by the Hardware trade. The reasonableness of this appeal will be recognized, and will, we doubt not, have a hearty response from those to whom it is addressed:

WILLIAMSPORT, PA., June 12, 1889.

We, the undersigned Hardware dealers of Williamsport, Pa., desire to call your attention to the condition of the Hardware trade in this section. By the omnipotent power of an all-wise God, we are sufferers by the late overwhelming floods, which devastated our city and submerged in most cases our entire stock of merchandise. The loss among the Hardware dealers is larger than in any other line of merchandise. For us the labor of years has been swept away. Our loss is great, but our grit and nerve are still with us, and we desire to have our affairs adjusted so that we can continue business and make a success of the future, as we have of the past. Our trade being mostly among lumber men and house-builders, who, of course, are great sufferers, a danger still greater than the actual loss of our goods stares us in the face, from the fact that many of those to whom we have been selling goods are from the very same cause rendered incapable of paying what is due us. We cannot force collections even if we desired, because in hundreds of cases their houses and property have been swept away, and those who were in good circumstances a month ago are insolvent to-day. Public sentiment here would decry legal proceedings of any kind; and inasmuch as some of us may need your assistance in this hour of our adversity, we hope, should any of us seek an extension of time on goods purchased before June 1, 1889, that you will grant such an extension as may be deemed necessary.

Respectfully,

KLINE & Co.  
LEWIS & Co.  
WILLIAMSPORT HARDWARE AND  
STOVE COMPANY, LIMITED.  
T. J. FUNSTON & Co.  
F. H. KELLER & Co.  
A. B. NEYHART & Co.  
BECK BROS. & Co.

#### Trade Topics.

Our readers will remember that a few weeks ago we published an extract from an article in the *Commercial Bulletin* of Los Angeles, Cal., relating to the appointment of Pacific Coast agencies, with headquarters at San Francisco, in which the point was made that such agencies are not satisfactory to the business men of Los Angeles, while reference at the same time was made to the growing importance of that city as a trade center. From a prominent Hardware house of that city we have received a letter bearing upon this subject, in which it is pointed out that the position of the newspaper from which we quoted is untenable, inasmuch as Los Angeles agencies are pretty well established and the commission business well represented in that city. Our correspondents say:

The writer of the article in the *Commercial Bulletin* evidently is not acquainted with the trade of Los Angeles. To one who has been in business here for any length of time it would seem rather strange that there are no commission agents in the Southern country. The fact is there are a great many of them, and a majority handle goods directly from the East, receive orders and transmit them to manufacturers without being in any way connected with San Francisco houses. Almost all lines of goods are represented in that way, and there are so many firms who are doing a commission business that we doubt if more than one or two of them are making any money.

The majority of the business houses here either have their representative buyers in the East who are purchasing for them and taking advantage of the market, or else they are such small dealers that they are unable to buy any quantity large enough to ship from the East. In this way it makes the success of the commission houses rather doubtful. The same rules which would govern the commission houses in the East will not control the business here, because the distance from the market and the quantity of goods which must be ordered to obtain advantage of the lowest freight will allow but comparatively few houses that are now doing business here to order through these agents. Another reason is that most of these commission merchants have opened up business since trade here has decreased, and at a time when the majority of the houses were overstocked. In time undoubtedly there will be a good opening for them here, but we must differ with the account in the *Commercial Bulletin*, that they are subservient to San Francisco houses and have no headquarters here dealing direct with the manufacturers.

We have also the following advices bearing upon the same question, in which our correspondents refer to the mistakes sometimes made in regard to Pacific Coast agencies, and referring also to the importance of Los Angeles as a trade center:

The Eastern manufacturers make a mistake in establishing agencies for the Pacific Coast with headquarters at San Francisco, and a greater mistake when they give the exclusive sale of their goods for the Pacific Coast to San Francisco jobbers. A fair example is in the Granite-Ware manufacture. Because San Francisco sold Granite-Ware when Southern California, you may say, was a wilderness, Los Angeles merchants in a city of nearly 100,000 inhabitants must buy their supply in San Francisco! As well ask the jobbers of Chicago to get their supply from Buffalo. San Francisco has lost its grip on this part of the State. Goods in the Hardware line are sold at better figures here than in San Francisco. When the Interstate Commissioners give us the benefit of the short-haul clause of the law San Francisco cannot compete with us. Why should she, being over 500 miles further from the Eastern markets? Los Angeles will be in the future as it is now the metropolis of Southern California. Notwithstanding the business depression, as a consequence of the great real-estate excitement, the city is advancing rapidly in population, as well as all Southern California. The costly and permanent improvements going forward in this city and part of the State show the confidence that the people that know this section of our country best have in its future. It is a section that the Eastern manufacturer of Hardware cannot overlook.

The freight question in Iowa continues to attract much attention and there is a good deal of feeling in regard to it. The roads running through the State have, we are advised, taken off many of their passenger trains on north and south lines and lessened their other trains, and are changing their time-tables needlessly in order to coerce the acceptance of their freight rates. With a view to getting at the merits of the case and to obtain information the Governor is sending out printed circulars to the shippers of the State propounding these questions:

1. How do the local freight rates of the railroads patronized by you compare with the rates in force two years ago?
2. Are the present rates satisfactory to the shippers of your locality?
3. If they are not satisfactory, state in what respect the present tariffs are deemed deficient or unjust.
4. Has the passenger service in your locality deteriorated, and if so, to what extent?
5. Are you in favor of State control of railroads?
6. What railroad legislation, if any, would you recommend for the future?

The controversy is evidently waxing warm, and it remains to be seen what the outcome will be.

The proper organization of a business house with a view to economy and efficiency of administration in the different departments is an important matter which is touched upon by a Western correspondent, who says:

I find many firms made up of a practical Hardware man and tinner who have their different departments in charge. In many cases in addition to these a third has been associated with the other two, who takes charge

of the books and collections. Having one partner, each acquainted with a particular kind of work, doing the buying for that department, puts the business on an excellent basis, as each is responsible for a certain part of the results.

We have the following advices from Louisville, Ky., under date June 8:

The Hardware trade of Louisville, Ky., is remarkably good for this season of the year. It is a source of wonder where the enormous volumes of goods go to, as the spring trade was remarkably large, and now that the farmers are busy in the fields, it is hard to say who buys the goods from the retailer, for he is patronizing the jobber very liberally. For some time a continued drought made dealers hold back in the tobacco and cotton sections, but now plentiful rains insure the crops to be fair anyhow. More agricultural machinery than usual has been bought this season than formerly. Bar-Iron and Merchant Steel are in fair demand, and many inquiries coming from Southern quarters show that the Birmingham mills must be full, as the Southern mills have latterly supplied the trade. Sheet-Iron is quite stiff, few mills being able to take new orders. The extreme low prices of Cut and Wire Nails are having the effect of some heavy buying, many mills refusing orders at lower figures; so now the buyers believe the manufacturers cannot go much lower and run. The approaching season for the low water in the river and annual labor troubles compel the mills to call somewhat of a halt. From the amount of Nails and Wire going out one might suppose that all the barns and fences in the Central and Southern States were down, if it were not for the fact that this vast country is fast opening up and being improved, new railroads going out in all directions, and cheap goods are aiding the good work of progress. The Barb-Wire mills are remarkably busy for this season, as many cases are reported of delayed shipments and refusals of large orders. The unlicensed Wire manufacturers are making strenuous efforts through their Cincinnati office to induce dealers to fearlessly take hold of their Wire, and of course it has a depressing effect on other makes, as it is sold 5 cents below ordinary quotations. Builders' Hardware is rapidly going out, and Wagon and Carriage goods show a lively trade. In fact, the jobbers report extraordinarily large sales during May, and trial-balances show satisfactory figures for the closing six months.

## REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

### Oils.

There have been no striking features in the market for animal and vegetable Oils. Outside of the ordinary jobbing movement there is little going on at the moment, and surface appearances suggest a conservative disposition on the part of buyers generally. Prices have undergone comparatively unimportant variation.

*Linseed Oil.*—The position is practically the same as described last week. Seed continues high, with only moderate supplies on the spot, very little "outside" Oil comes this way, and city crushers are disposing of the bulk of their current output. Prices remain very firm on the basis of 60 cents for city brands of Raw.

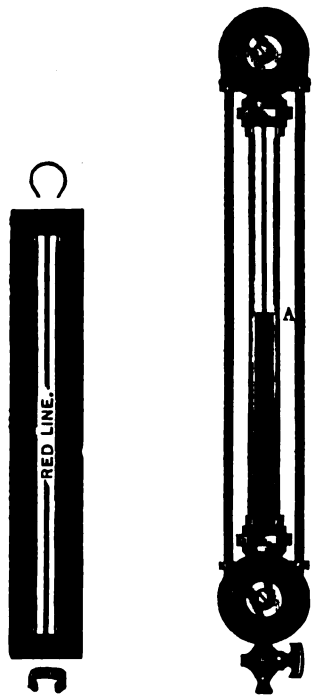
*Cotton-Seed Oil.*—In the local market business has been of rather small volume and the demand moderate. Supplies here consist mainly of "off" grades, and while these may be had at some modification of





### American Water-Gauge Reflector.

It is a conceded fact that the reflecting feature found in the French red-line reflecting gauge glasses is a very decided advantage over the well-known Scotch gauge tubes. The former have upon them a narrow red line which is greatly magnified by the water in the tube, so that the height of the water is made remarkably distinct, as it is indicated by a very broad red line. This desirable end has now been accomplished by Pancoast & Maule, of Philadelphia, Pa., who by means of a very simple addition provide an ordinary tube with all the advantages of the French. As shown by cuts, the reflector consists simply of a narrow concave strip of light copper, coated all over with white enamel, having a longitudinal red stripe, similar to that on the French glass. This strip fits neatly against the glass, and is held in its proper position by two small steel clasps, and as a result an optical illusion,



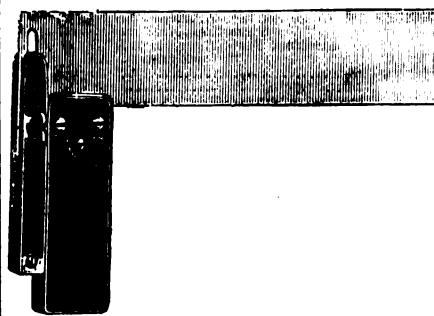
American Water-Gauge Reflector.

precisely similar to that produced by the French red-line glass, is obtained on any water-gauge to which the reflector is attached. In gauges fitted with the American reflector the water with which the tube is partially filled appears to be of a brilliant red in color, and the height of it can be noted in an instant at a distance of 50 feet or more. On boilers which are located in basements, cellars or other places where the light is poor, such as steamers, mines, &c., the American reflector will be found a very valuable assistant to the engineer or stoker.

### The Fox Adjustable Try and Bevel Square.

This article is manufactured under a recent patent by the Bridgeport Steel Cutting Company, Bridgeport, Conn. It is represented in the illustration herewith. From this it will be seen that it consists of a try-square with an attachment on the back of the handle by means of which it is readily converted into a bevel, which is easily given a variety of adjustments, by means of which it can be set for any pitch or angle. The bevel attachment is a sliding bar on the back of the handle, and on it are marks for pitches from 7 to 16 inches, and another mark on the back of the square blade, which is used in giving

the adjustment desired. For example, in order to obtain a 7-inch pitch the sliding bar is placed in such a position that the mark 7 is in an exact line with the notch cut in the back of the square blade, and it is fastened in that position by means of the thumb-screw, when by placing the top of the slide and the rounding corner of the handle against the work the line of the blade will indicate the correct

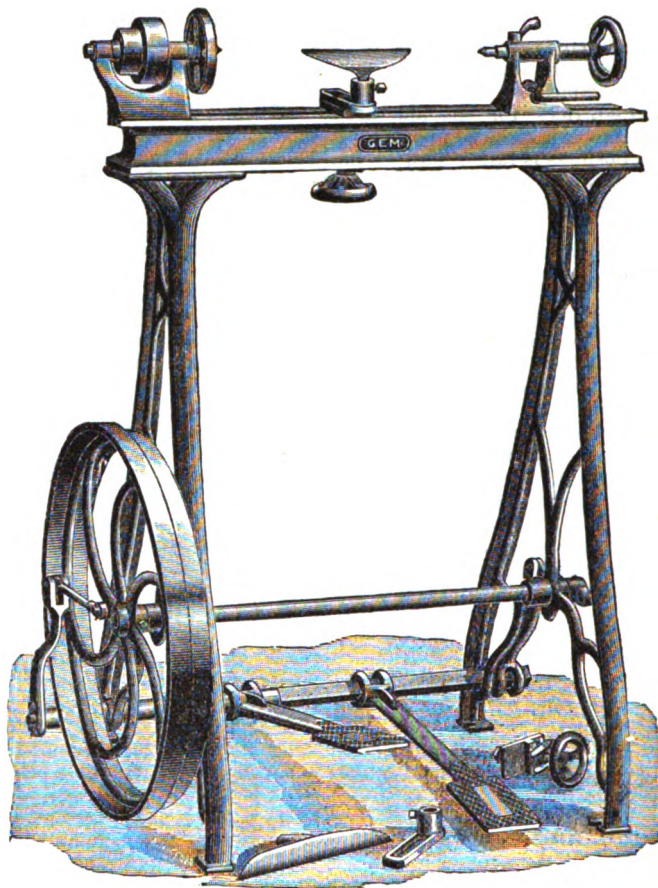


The Fox Adjustable Try and Bevel Square.

of other tools, and combines in convenient form the try, bevel and miter square, and is thus adapted to a wide variety of uses. It is also to be borne in mind that when set for any pitch or angle the try-square can also be used. The quality of the workmanship and the accuracy of the tool are other points to which the company directs attention. Its price, 8-inch, is \$15 per dozen, with a discount to the trade.

### The Gem Lathe.

The lathe here illustrated was designed by the Seneca Falls Mfg. Company, of Seneca Falls, N. Y., to meet the demand for a light, substantial and practical working lathe at a low price. It is provided with a patent foot-power by which the greatest power is produced with little fatigue. This consists of double treadles



The Gem Lathe.

bevel or pitch desired. In the same manner it may be adjusted for a pitch of either 8, 9, 10, 11, 12, 13, 14, 15 or 16 inches. The marks for octagon or pitches of 5 and 6 inches are on the top of the slide, there being a corresponding notch in the top of the blade. It will thus be seen that this ingenious and well-made tool can be set instantly to any pitch or rise from 5 to 16 inches without the aid

having a walking motion and which are movable and work independently of each other. They are connected to the opposite ends of the driving-wheel shaft in such a manner as to produce a strong, positive and continuous power. The lathe may be driven by either treadle standing or both treadles sitting. The head-stock has a two-speed cone for a 1-inch flat belt, hollow steel spindle having a  $\frac{1}{4}$ -inch hole and anti-friction metal-lined boxes, which are adjustable to take up wear. The tail-stock has a steel spindle with self-discharging center. A slide-rest and a counter-shaft can be furnished with the lathe when desired. The lathe weighs 110 pounds.

### The Colby Wringer.

One of the points emphasized by the Colby Wringer Company, Montpelier, Vt., in regard to the Colby Wringer, of which we gave a description last week, is the fact that when removed from the tub the rolls are relieved from pressure. By an erroneous substitution of *can* for *cannot* a contrary statement was made in the article, where it was asserted that the wringer *can* be removed from the tub without at the same time taking the pressure off the rolls. This point is an important one in the machine, as it will be perceived that the wringer is thus given greater durability, inasmuch as when not on the tub its rolls are entirely free from the injury that results from continued pressure, which robs them after a time of their elasticity.



**Galvanized Tea-Kettle.**

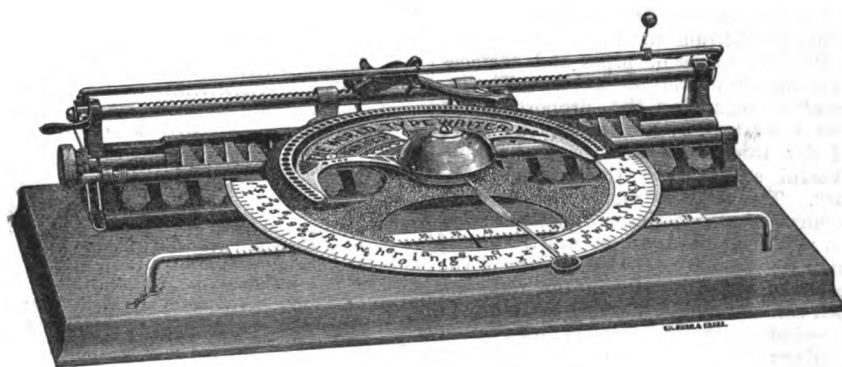
The accompanying illustration represents a new galvanized sheet-metal tea-kettle which has recently been placed on the market by Sidney Shepard & Co., Buffalo, N. Y., who refer to it as a novelty of merit, it being light, serviceable and reasonable in price. It is galvanized

*Galvanized Tea-Kettle.*

after being put together, thus soldering all the seams and coating the entire surface so as to prevent rusting. Apart from the objections that exist to the use of galvanized metal for cooking purposes, or in connection with water which is to be drunk, this article would appear to be possessed of advantages which will commend it to the trade.

**The Double-Case World Type-Writer.**

This type-writer is put on the market by the Pope Mfg. Company, Boston, Mass., and is represented in the accompanying illustration. The single-case World type-writer has been on the market for two years, but the double-case machine, which writes both capitals and small letters, has only recently been offered to the trade. The illustration pretty clearly indicates its construction. It writes 76 characters, including capitals and small letters, numerals and punctuation points. With the exception of being  $\frac{1}{4}$  inch wider, it occupies the same space as the single case and its operation is the same. The compactness of this machine is referred to as giving advantages: It is 12 inches in length, 6 inches wide,  $2\frac{1}{4}$  inches high and weighs a little less than 4 pounds. Consequently it can easily be placed in a convenient position on the desk or in the drawer, not necessitating a table or a change of position when a letter is to be written. The principle of indicating with one hand and printing with the other

*The Double-Case World Type-Writer.*

is referred to as giving this machine a speed which is not attained in others of its class, which are operated with only one hand. The direct printing of the types on the paper is also alluded to as giving a better impression than it is possible to obtain where a ribbon is used. It is also pointed out that no amount of use can change the alignment and the cost of repairs is trivial. The construction is such that the friction is reduced to a minimum. A neat walnut

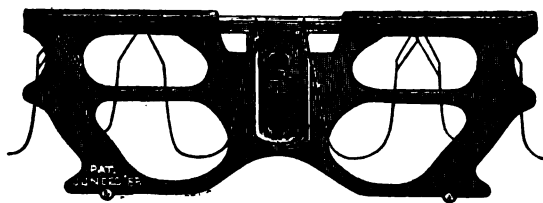
case fitted with a handle is made for the machine and is convenient for carrying it about. It has less than 40 parts and employs but one active spring. It is light and strong and seldom needs repairing and is practically indestructible. The following additional particulars in regard to this machine, with some reference to type-writers in general, are furnished us by the company:

It does not get out of order easily, the alignment is perfect, the parts are all interchangeable, it employs no ribbons to dirty the fingers, writes on paper of any width or thickness, will address envelopes, postal-cards or tags more easily than any other type-writer. For filling in blanks it cannot be excelled. Its writing will copy-press better than a letter written with copying-ink. It can be used in connection with hektograph and a large number of perfect copies taken. It is easy to carry, and many traveling men who for years have wrestled with a hotel pen claim that they cannot get along without it. It takes very little practice to learn to work the machine rapidly. Its action is positive and it cannot lap or skip. Simplicity is one of the points of the machine. In 15 minutes an ordinarily intelligent person can write almost as rapidly with this type-writer as with the pen. With an hour's practice a day for a week one can write 50 per cent. more rapidly than with the pen.

The single case machine writing 44 characters is sold for \$10, and the double case, writing 76 characters, as above mentioned, is sold for \$15.

**Giant-Saw Tool.**

E. C. Atkins & Co., manufacturers of saws, tools and mill specialties at Indianapolis, Ind., with branches at Memphis, Tenn., and Minneapolis, Minn., have re-

*Giant-Saw Tool.*

cently brought out a new tool to be used in the care of cross-cut saws. It is called the Giant-saw Tool and is a combined jointer, raker, tooth gauge, side file and set-tooth gauge, all comprised in one tool, and is described as a most perfect tool for the purpose made. It is represented in

**Ice-Making Machines.**

The accompanying illustrations represent portable ice-making machines of foreign manufacture which are being introduced by the Francis T. Witte Hardware Company, 106 Chambers street, New York.

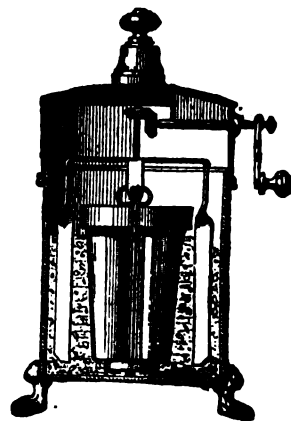
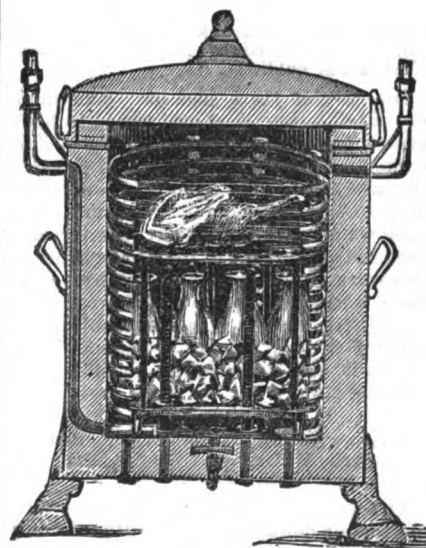
*Ice-Making Machine—Regular Pattern.*

Fig. 1 represents the usual pattern of the smaller sizes, Fig. 2 being a larger machine for restaurants and confectioners. From these illustrations, which show the inside arrangement of the machines, it will be seen that the receptacle which holds the water is turned by a crank similarly to an ice-cream freezer, there being around it a packing of special salts. The operation

of freezing is said to occupy 10 or 15 minutes. The smallest machine, No. 0, is for the production of  $\frac{1}{4}$  pound of ice, the larger ones making 1 pound,  $1\frac{1}{2}$ , 2, 4, 6, 9 or 18 pounds each. The salts, we are

*Ice-Making Machine for Restaurants, &c.*

advised, can be used over and over again by ebullition—that is, by putting the used and wet salts on a stove and allowing the water to evaporate. It will thus be seen that the ice is not produced by this ma-

chine in large quantities, but the machines are alluded to as valuable adjuncts to the kitchen outfits of yachts, camping parties, or in countries where ice cannot be obtained.

## NEW PUBLICATIONS.

**ELECTRICAL RULES, TABLES AND FORMULÆ.** Illustrated; Andrew Jamieson; Industrial Publication Company, New York, publishers. Price 75 cents.

This book gives what has long been needed—a clear and concise explanation of the rules and formulæ relating to electricity, together with tables on the same subject. The book will be appreciated by the electrical engineer, and also by the many users of electrical appliances, since the definitions it contains are so clearly explained as to be readily understood, even by those who are not electricians.

**PRACTICAL IRON FOUNDRY.** By the author of "Pattern Making," "Lockwood's Dictionary of Mechanical Engineering Terms," &c.; illustrated; Whittaker & Co., London; D. Van Nostrand Company, New York, publishers.

In a condensed and clear style an admirable definition of the principles and practice of iron-founding, aided by well-selected drawings showing the practice, is given in this work. The book begins with a discussion of the principles underlying iron-founding. Then follows a description of sands, tools, green-sand molding, machine-molding, cupolas and blast, &c. The work will be a valuable aid to those studying foundry-work, and will be of much assistance to any one who is interested in the subject. The appendix contains many useful tables relating to founding.

**THE ART OF SPECULATION.** By Roderick H. Smith, 6 Wall street, New York. 48 pages flexible cloth cover.

This is an ingenious work, intended as a guide to speculation in Wall street. The mode of procedure laid down is founded upon the rule of averages, the speculator buying a lot at every 1 per cent. decline and selling a lot at every 1 per cent. advance. The mathematical demonstration of the success attending the adoption of this rule appeals to the reason of the reader, but the author very decidedly proves also that capital is required, and that small operators are shut out.

**MANUAL OF AMERICAN WATER-WORKS.** M. N. Baker, editor *Engineering News*, New York, publisher.

For several years past our contemporary *Engineering News* has issued in book form a condensed history of the water-works of the United States and Canada. The new edition brings the classification down to date, and contains accounts of all those water-works which have been erected since the appearance of the former edition. This work is received as an authority upon water-works history, and is of great value to all those interested in the subject, because of the vast amount of reliable information it contains relating to all sources of water supply.

**A HISTORY OF THE PLANING MILL.** By C. R. Tompkins, M.E.; John Wiley & Sons, New York, publishers. Price, \$1.50.

The writer of this book, having been for 40 years or more identified with planing-mill machinery, speaks with confidence of the designs now well known and also of the needs of this important branch of mechanics. Opening his work with an early history of the planing-mill and the early inventions in England, he follows with descriptions showing the gradual advances and improvements made up to the present time. He then deals with the

practical operation of wood-working machinery and the adjusting and working of these appliances. Although the book is headed "A History of the Planing Mill," it is really a discussion of the construction, care and management of wood-working machinery in general, the subjects treated including the various kinds of wood-working machinery, lubrication, hints about molding-machines, responsibilities of foremen, advice to operators, artistic wood-work, shafting, belting, &c.

**HOT-WATER HEATING AND FITTING OR WARMING BUILDINGS BY HOT-WATER HEATING APPARATUS, THE METHODS OF THEIR CONSTRUCTION AND THE PRINCIPLES INVOLVED.** By William J. Baldwin; 385 pages; over 200 illustrations and diagrams, and 15 tables. Published by the *Engineering and Building Record*. Price, \$4.

The subject of warming buildings by hot water is attracting so much attention upon the part of the public at large at the present time, and is having such special study upon the part of all who are engaged in any branch whatsoever of the business of heating and ventilation, that the appearance of a manual or compendium devoted to it is of great importance. That the book should come from the pen of a writer so well known to steam engineers and to the readers of the technical press in general as William J. Baldwin gives it still further claims to examination, and demands for it careful scrutiny and intelligent criticism. The work has been prepared not alone for purely professional readers, but rather for the mechanic and hot-water heating fitter, as the amount of new matter which it contains relates chiefly to fittings rather than to the principles of heating. The greater portion of the matter contained in this book first appeared in the pages of the *Engineering and Building Record* in a series of articles. Since their appearance in that periodical they have been revised, and considerable new matter has been added pertaining to the subject above indicated.

Considering the work as a whole, it can only be regarded as a small original contribution to hot-water heating literature. The greater part of it is taken up with reiteration of experiments of some of the earlier investigators. Much time has been given to the calculations based on the accepted hydraulic formulas, but the space occupied in the explanation of how these calculations were made is of small importance to the practical reader. The results of this figuring are of use, and the methods proposed for proportioning and grading the sizes and areas of pipes might, with great advantage, receive more elaboration. Tables, in addition to the diagrams, giving the actual sizes of pipes and surfaces would have been very desirable. The information regarding the proportions of pipes is of benefit to the practical man, and for this alone the book becomes a useful addition to the engineer's library. The effort is more the work of a student of engineering authors than that of a practical mind, as an illustration of which we would cite the assumption of the temperature of the water in the radiators when calculating the heating surface. In the radiators in the greater number of buildings it is not common to get the temperature of the water entering the radiators to 210° F., the outside atmosphere being zero or 10° below zero. If, however, this high temperature is practicable, it is to be regretted that no case was shown where it occurs, and that no idea of the relative size and proportion of boiler and heating surface was given to attain such results. In the only practical experiment made by the author, and referred to on page 166, he states that the highest temperatures attained in two tests of the water entering coils were 195° and 206° F., while the outside air was 85° and 78°. Here was a case of one boiler sup-

plying 122 square feet of surface so that 210° might, if possible, be attained. It being the first literary contribution to hot-water heating in the United States, it is worthy of all the attention it will attract, and it is surely the precursor of many practical American additions to the library of hot-water heating literature.

## THE LOCOMOTIVE.

We have received volume IX, covering the year 1888, of our valuable contemporary the *Locomotive*. We always look forward with interest to the advent of the monthly edition of our contemporary, and since the numbers are used extensively in abstracting we are always pleased to receive the bound volume at the end of the year, which we can keep in complete form for reference.

The Customs Department of the Dominion of Canada promulgated the following decisions in regard to duties on the 1st inst.: Lemon-squeezers, made wholly of glass, 20 per cent.; Paris white, dry, 20 per cent.; patent carbon enamel (composed of fusel-oil, &c.), \$1.90 per gallon; wire ferrules, iron, steel or brass, 80 per cent.

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# CURRENT HARDWARE PRICES.

JUNE 19, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, # 1000—	
Hicks & Goldmark's	
F. L. Waterproof, 1-10's	50¢
E. B. Trimmed Edge, 1-10's	55¢
E. B. Grnd. Edge, Cent. Fire	75¢
Double Waterproof, 1-10's	1.40
Musket Waterproof, 1-10's	50¢
G. D.	25¢
S. B.	30¢
Union Metallic Cartridge Co.	
F. C. Trimmed	50¢
F. L. Ground	25¢
Cent. Fire Ground	75¢
Dbl. Waterproof, in 1-10's	1.40
Dbl. Waterproof, in 1-10's	1.40
S. B. Genuine Imp.orted	45¢
Eley's E. B.	54¢
Eley's D Waterproof, Central Fire	1.50

Cartridges.	
Rim Fire Cartridges	50¢ & 52¢
Rim Fire Military	15¢ & 2¢
Cent. Fire, Pistol and Rifle	25¢ & 52¢
Cent. Fire, Military and Sporting	15¢ & 52¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.	
Blank Cartridges, 22 cal.	1.75
Blank Cartridges, 32 cal.	3.50
Primed Shells and Bullets	15¢ & 52¢
B. B. Caps, Round Ball, 1.75	
B. B. Caps, Con. Ball, Swgd.	2.00

Primers.	
Berdan Primers	1.00
B. L. Caps (for Sturtevant Shells)	1.00
All other Primers	1.20

Shells.	
First quality, 4, 8, 10 and 12 gauge	25¢ & 10¢
First quality, 14, 16 and 20 gauge (10 list)	50¢ & 10¢
Star, Club, Rival and Climax brands	20¢ & 10¢
Seibold's Comb. Shot Shells	15¢ & 2¢
Brass Shot Shells, 1st quality	60¢ & 2¢
Brass Shot Shells, Club, Rival, Climax	55¢ & 2¢
I X L, 10 and 12 gauge	40¢ & 2¢
"Special," 16 gauge	30¢ & 10¢
"Special," 10 and 12 gauge	40¢ & 10¢
Fowler's Pat.	35¢ & 2¢

Shells Loaded—	
A. M. Co. List No. 19, 1887	40¢ & 10¢
Wads—	
U. M. C. & W. R. A.—B. E., 11 up	2.00
U. M. C. & W. R. A.—B. E., 9 & 10	2.30
U. M. C. & W. R. A.—B. E., 7 & 8	2.60
U. M. C. & W. R. A.—P. E., 11 up	3.10
U. M. C. & W. R. A.—P. E., 9 & 10	4.00
U. M. C. & W. R. A.—P. E., 7 & 8	4.90
Eley's B. E., 11 up	1.75
Eley's P. E., 11 up	2.80

Anvils.—	
Eagle Anvils, # 10	20¢ & 25¢
Peter Wright's	94¢
Armington's Mouse Hole	24¢
Armington's Mouse Hole, Extra	1.11
Trenton	94¢
Wilkinson's	94¢
J. & Riley Carr, Pat. 84	1.11
Moore & Barnes Mfg. Co.	33¢
Anvil Vise and Drill—	
Millers Falls Co.	18.00
Cheney Anvil and Vise	25¢
Allen Anvil and Vise	30.00

Apple Parers—	
Advance	50¢
Antrim Combination	5.50
Baldwin	5.25
Champion	7.25
Eureka, 1888	17.00
Family Bay State	12.00
Gem	5.25
Gold Medal	3.75
Hudson's New '88	4.75
Ideal	30.00
Improved Bay State	4.25
Little Star	13.50
Monarch	5.50
New Lightning	4.00
Oriole	4.00
Penn.	4.00
Perfection	4.00
Pomona	4.00
Rocking Table	5.50
Turntable	5.50
Victor	13.50
Waverly	4.50
White Mountain	4.25
72	5.75
78	5.75

Augers and Bits—	
Douglas Mfg. Co.	
Wm. A. Ives & Co.	70%
Humphreysville Mfg. Co.	
French, Swift & Co. (F. H. Beecher)	
Rockford Bit Company	
Cook's, Douglas Mfg. Co.	55¢
Cook's, N. H. Copper Co.	50¢ & 10¢
Ives' Circular Lip	60%
Patent Solid Head	30%
C. E. Jennings & Co., No. 10, extension lip	40%
C. E. Jennings & Co., Auger Bits, # set, 32 1/4 quarters, No. 8, 25; No. 30, 35.50	20%
Lewis' Patent Single Twist	45%
Jennings' Augers and Bits	25%
Imitation Jennings' Bits	60¢ & 10¢
Pugh's Black	20%
Rockford, Jennings' Pattern	60%
Car Bits	50¢ & 10¢
L. Hommedieu Car Bits	15¢ & 10¢
Forstner Pat. Auger Bits	10%

## Hollow Augers—

Ives'	
French, Swift & Co.	33 1/2¢
Douglas'	33 1/2¢
Bonney's Adjustable, # doz	48
Stearns'	40¢ & 10¢
Ives' Expansive, each \$4.50	50¢ & 5¢
Universal Expansive, each \$4.50	20%
Wood's	25¢ & 25¢ & 10%

## Expansive Bits—

Clarks' small, 18; large, 26	35¢ & 35¢ & 5¢
Ives' No. 4, # doz	60
Swan's	40%
Stearns' No. 1, 26; No. 2, 22	35%
Stearns' No. 2, 24	20%

## Gimlet Bits—

Common	# gross \$2.75 to \$3.25
Diamond	# doz \$1.10
Bee	25¢ & 25¢ & 5¢
Double Cut, Sheppardson's	45¢ & 45¢ & 10%
Double Cut, Ct. Valley Mfg. Co.	50¢ & 10%
Double Cut, Hartwell's, # gro	55¢ & 25
Double Cut, Douglas'	40¢ & 10%
Double Cut, Ives'	60¢ & 60¢ & 10%

## Bit Stock Drills—

Morse Twist Drills	50¢ & 10¢ & 5¢
Standard	50¢ & 10¢ & 5¢
Cleveland	50¢ & 10¢ & 5¢
Syracuse, for metal	50¢ & 10%
Syracuse, for wood (wood list)	30¢ & 30¢ & 5¢
Williams' or Holt's, for metal	50¢ & 10¢ & 10%
Williams' or Holt's, for wood	40¢ & 10%

## Ship Augers and Bits—

L'Hommedieu's	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Watrous'	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's Ship Auger Pat'n Car Bits	15¢ & 10¢ & 15¢ & 10¢ & 5¢

## Awl Hafts—

Sewing, Brass Fer. # gr	35.50
Pat. Sewing, Short, # doz	40
Pat. Sewing, Long, # doz	1.20
Pat. Peg, Plain Top, # gr	10.00
Pat. Peg, Leather Top, # gr	12.00

## Awls, Brad Sets, &c—

Awls Sewing, Common	# gr \$1.70, 35¢
Awls, Should. Peg, # gr	2.45, 40¢ & 10¢
Awls, Pat. Peg, # gr	63¢
Awls, Shouldered Brad, 2.70 # gr	35¢
Awls, Handled Brad, # gr	45¢
Awls, Handled Scratch, # gr	7.50, 35¢ & 10%
Awls, Socket Scratch, # doz	1.50, 25¢ & 30%

## Awl and Tool Sets—

Alken's Sets, Awls and Tools	
No. 20, # doz	10.00
Pray's Adj. Tool Hds., No. 1, # doz	12, 3, 118
3, # doz	25
Miller's Falls Adj. Tool Hds.	
No. 1, # doz	12, 2, 118
Henry's Combination Hart, # doz	6.50
Brad Sets	
No. 42, # doz	10.50
No. 43, # doz	12.50
Stanley's Excelsior	
No. 1, # doz	7.50
No. 2, # doz	4.00
No. 3, # doz	5.50

## Axes—

Makers' and Special Brands—	
First quality	# doz \$6.00 to \$6.50
Others	# doz \$5.50 to \$5.75

## Axle Grease—

Fraser's	Keg # 4¢, Pall # 5¢
Fraser's, in boxes	# gr \$0.50
Dixon's Everlasting, in boxes	# doz 1¢
Dixon's Everlasting, 10-b pails, ea.	55¢
Lower grades, special brands	# gr \$5.50 to \$5.75

## Axles—

No. 1	4¢ & 4 1/2¢, No. 2 5 1/2¢ & 5 1/2¢
Nos. 7 to 14	55¢ & 5¢
Nos. 15 to 18	47 1/2¢
Nos. 19 to 22	70%
National Tubular Self-Oiling: Standard	
Farm (1 to 5) and Special Farm (AI	
to A5)	
Less than 10 sets	33 1/2¢
Over 10 sets	33 1/2¢ & 5¢

## Bag Holders.—

Spangle's Pat.	# doz \$18
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## Balances—

Spring Balances	50%
Common 24-lb	# doz \$1.50
Chattillon's Spring Balances	50%
Chattillon's Circular Spring Balances	60%

## Bells—

### Hand—

Light Brass	70¢ & 10¢ @ 70%
Extra Heavy	60¢ & 10%
V. H. Metal	60¢ & 10¢ & 10%
Silver Chime	33 1/2¢ & 10%
Globe (Cone's Patent)	25¢ & 10¢ & 35%

### Door—

Gong, Abbe's	33 1/2¢ & 10%
Gong, Yankee	45¢ & 10%
Gong, Barton's	40¢ & 10¢ & 50%
Crank Taylor's	25¢ & 10%
Crank Brooks	50¢ & 10¢ & 25%
Crank, Cone's	10%

Crank, Connel's	20¢ & 10%
Lever, Sargent's	60¢ & 10%
Lever, Taylor's Bronzed or Plated	net
Lever, Taylor's Japanned	25¢ & 10%
Lever, R. E. M. Co.'s	50¢ & 10¢ & 25%
Pull, Brook's	50¢ & 10¢ & 25%
Pull, Western	25¢ & 10%

Common Wrought	60¢ & 10%
Western	20¢ & 10%
Western, Sargent's list	70¢ & 10%
Kentucky, "Star"	70¢ & 10%
Dodge, Genuine Kentucky	70¢ & 10%
Texas Star	50¢ & 10¢ & 50¢ & 10¢ & 25%
Call	40¢ & 40¢ & 25%
Farm Bells	# B 3¢ & 3 1/2¢
Steel Alloy Church and School Bells	40%

## Bellows—

Blacksmiths'	50¢ & 10¢ & 60%
Molders'	40¢ & 40¢ & 10%
Hand Bellows	40¢ & 10¢ & 60%

## Belting, Rubber—

Common Standard	70¢ & 10%
Standard	70¢ & 70¢ & 5¢
Extra	60¢ & 5¢ & 60¢ & 10%
N. Y. B. & P. Co., Carbon	60¢ & 10¢ & 5¢
N. Y. B. & P. Co., Diamond	50¢ & 10%

## Bench Steps—

Morrill's	# doz \$0, 50%
Hutchkiss's	# doz \$5, 10¢ & 10¢ & 10%
Weston's, No. 1, # doz	10, No. 2, \$0.25 & 10¢ & 5¢
McGill's	# doz \$3

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c.	
See Augers and Bits.	

## Bit Holders—

Extension,	
Barber's, # doz	15.00
Ives, # doz	20.00
Diagonal, # doz	24.00
Angular, # doz	24.00

## Blind Adjusters—

Domestic	# doz \$3.00, 33 1/2¢
Excelsior	# doz \$10.00
Washburn's Self-Locking	30¢ & 30¢ & 10%

## Blind Fasteners—

Macrell's, # doz	1.00
Van Sand's Screw Pat., # doz	15
Van Sand's Old Pat., # doz	15.00
Washburn's Old Pattern, # gr	55¢ & 10%
Merriman's	new list
Austin & Eddy No. 8008, # gr	30.00
Security Gravity, # gr	30.00

## Blind Staples—

Barbed, 1/4 in. and larger	# B 7 1/2¢ & 8¢
Barbed, 3/4 in.	# B 8 1/2¢ & 9¢

## Blocks—

Ordinary Tackle, list May 20, 1889	40¢ & 10¢ & 50%
Cleveland Block Co., Mal. Iron	50%
Moore's Novelty, Mal. Iron	50%

## Bolts—

Door and Shutter—	
Cast Iron Barrel, Square, &c.	70¢ & 70¢ & 10%
Cast Iron Shutter Bolts	70¢ & 70¢ & 10%
Cast Iron Chain (Sargent's list)	55¢ & 10%
Ives' Patent Door Bolts	60%
Wrought Barrel	70¢ & 70¢ & 10%
Wrought Square	70¢ & 70¢ & 10%
W't Shutter, all Iron, Stanley's	60¢ & 10%
W't Shutter, Brass Knob	40¢ & 10%
W't Shutter, Sargent's list	60¢ & 10%
W't Sunk Flush, Sargent's list	55¢ & 10%
W't Sunk Flush, Stanley's list	50¢ & 10%
W't B.K. Flush, Com'n	55¢ & 10%

## Carriage, Machine, &c.—

Com. list June 10, '84	75¢ & 10¢ & 25%
Genuine Eagle, list Oct. '84	75¢ & 10%
Phila. pattern, list Oct. '84	75¢ & 10%
R. B. & W., old list	70%
Machine, according to size	75¢ & 10¢ & 80%
Bolt Ends, according to size	75¢ & 10¢ & 80%

## Tire—

Common, list Feb. 28, '88	70%
Port Chester Bolt and Nut Company	
Empire, list Feb. 28, '88	70%
Phila., list Oct. '84	82 1/2%
Keystone, Philadel., list Oct. '84	80%
Norway, Phila., list Oct. '84	75¢ & 10%
American Screw Company	
Norway, Phila., list Oct. 16, '84	75¢ & 10%
Eagle, Phila., list Oct. 16, '84	80%
Phila., list Oct. 16, '84	82 1/2%
R. B. & W., Philadel., list Oct. 16, '84	82 1/2%

## Stove and Flow—

Stove	65%
Flow	60¢ & 5¢
R. B. & W., Flow	55%

## Borax—

Without	# B 9 1/2¢ & 10 1/2¢
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## Boring Machines—

Douglas	\$5.50 to \$6.75
Snell's, Rice's Pat.	5.50 to 6.75
Jennings	5.50 to 6.75
Other Machines	2.35 to 2.75
Phillips' Patent	
With Augers	00 to 7.50

## Bow Pins—

Humason, Beckley & Co.'s	60¢ & 10%
Sargent & Co.'s	17 and 18
Peck, Stow & W. Co.	50¢ & 10¢ & 50¢ & 10¢ & 5¢

## Braces—

Barber's	
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<b>Cards</b>	
Horse & Carry	10&10&10&10&10
Cotton	10&10&10&10
Wool	10&10&10&10
<b>Carpet Stretchers</b>	
Cast Steel, Polished	7 doz \$2.25
Cast Iron, Steel Points	7 doz \$2.00
Socket	7 doz \$1.75
Bullard's	25&25&10
<b>Carpet Sweepers</b>	
Bissell No. 5	7 doz \$17.00
Bissell No. 7 New Drop Pan	7 doz \$18.00
Bissell, Grand	7 doz \$34.00
Grand Rapids	7 doz \$34.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00	
Magic	7 doz \$15.00
Improved Parlor Queen	7 doz \$17.00
Nickel	7 doz \$27.00
Japaned	7 doz \$24.00
Excelsior	7 doz \$22.00
Garland	7 doz \$18.00
Parlor Queen	7 doz \$24.00
Housewife's Delight	7 doz \$15.00
Queen, with band	7 doz \$15.00
King	7 doz \$30.00
Weed, Improved	7 doz \$18.00
Hub	7 doz \$15.00
Cog Wheel	7 doz \$15.00
Conqueror	7 doz \$22.00
Easy	7 doz \$22.00
Monarch	7 doz \$22.00
Goshen	7 doz \$21.00
Advance	7 doz \$18.00
Ladies' Friend, No. 1, 7 doz, \$15.00; No. 2, 7 doz, \$15.00	
American	7 doz \$15.00
Grand Republic	7 doz \$35.00
<b>Cartridges</b>	
See Ammunition.	
<b>Casters</b>	
Bed	Brass, 55&55&10
Shallow Socket	Others, 50&50&10
Deep Socket	40&10
Yale Casters, list May, 1888	30&10&40
Yale, Gem	60&60&5
Martin's Patent (Phoenix)	45&10&50
Payson's Anti-friction	60&60&10
Giant Truck Casters	30
Stationary Truck Casters	50&10
Socket Truck Casters	50
<b>Cattle Leaders</b>	
Humason, Beckley & Co.'s	70
Sargent's	60&10
Hotchkiss	30
Peck, Stow & W. Co.	50&10
<b>Chain</b>	
Trace, 6-10-3, exact, 7 pair, \$1.08	50&10&50&10&25
Trace, 6-10-3, exact, 7 pair, 92¢	50&10&50&10&25
Trace, 7-10-2, exact, 7 pair, \$1.11	50&10&50&10&25
Trace, 7-10-2, exact, 7 pair, 92¢	50&10&50&10&25
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1888	50&10&50&10&25
American Coll. in each lot, 3-16 1/4 5-16 3/4 7-16 1/2 9-16 1/2 11-16 1/2 13-16 1/2 15-16 1/2 17-16 1/2 19-16 1/2 21-16 1/2 23-16 1/2 25-16 1/2 27-16 1/2 29-16 1/2 31-16 1/2 33-16 1/2 35-16 1/2 37-16 1/2 39-16 1/2 41-16 1/2 43-16 1/2 45-16 1/2 47-16 1/2 49-16 1/2 51-16 1/2 53-16 1/2 55-16 1/2 57-16 1/2 59-16 1/2 61-16 1/2 63-16 1/2 65-16 1/2 67-16 1/2 69-16 1/2 71-16 1/2 73-16 1/2 75-16 1/2 77-16 1/2 79-16 1/2 81-16 1/2 83-16 1/2 85-16 1/2 87-16 1/2 89-16 1/2 91-16 1/2 93-16 1/2 95-16 1/2 97-16 1/2 99-16 1/2 101-16 1/2 103-16 1/2 105-16 1/2 107-16 1/2 109-16 1/2 111-16 1/2 113-16 1/2 115-16 1/2 117-16 1/2 119-16 1/2 121-16 1/2 123-16 1/2 125-16 1/2 127-16 1/2 129-16 1/2 131-16 1/2 133-16 1/2 135-16 1/2 137-16 1/2 139-16 1/2 141-16 1/2 143-16 1/2 145-16 1/2 147-16 1/2 149-16 1/2 151-16 1/2 153-16 1/2 155-16 1/2 157-16 1/2 159-16 1/2 161-16 1/2 163-16 1/2 165-16 1/2 167-16 1/2 169-16 1/2 171-16 1/2 173-16 1/2 175-16 1/2 177-16 1/2 179-16 1/2 181-16 1/2 183-16 1/2 185-16 1/2 187-16 1/2 189-16 1/2 191-16 1/2 193-16 1/2 195-16 1/2 197-16 1/2 199-16 1/2 201-16 1/2 203-16 1/2 205-16 1/2 207-16 1/2 209-16 1/2 211-16 1/2 213-16 1/2 215-16 1/2 217-16 1/2 219-16 1/2 221-16 1/2 223-16 1/2 225-16 1/2 227-16 1/2 229-16 1/2 231-16 1/2 233-16 1/2 235-16 1/2 237-16 1/2 239-16 1/2 241-16 1/2 243-16 1/2 245-16 1/2 247-16 1/2 249-16 1/2 251-16 1/2 253-16 1/2 255-16 1/2 257-16 1/2 259-16 1/2 261-16 1/2 263-16 1/2 265-16 1/2 267-16 1/2 269-16 1/2 271-16 1/2 273-16 1/2 275-16 1/2 277-16 1/2 279-16 1/2 281-16 1/2 283-16 1/2 285-16 1/2 287-16 1/2 289-16 1/2 291-16 1/2 293-16 1/2 295-16 1/2 297-16 1/2 299-16 1/2 301-16 1/2 303-16 1/2 305-16 1/2 307-16 1/2 309-16 1/2 311-16 1/2 313-16 1/2 315-16 1/2 317-16 1/2 319-16 1/2 321-16 1/2 323-16 1/2 325-16 1/2 327-16 1/2 329-16 1/2 331-16 1/2 333-16 1/2 335-16 1/2 337-16 1/2 339-16 1/2 341-16 1/2 343-16 1/2 345-16 1/2 347-16 1/2 349-16 1/2 351-16 1/2 353-16 1/2 355-16 1/2 357-16 1/2 359-16 1/2 361-16 1/2 363-16 1/2 365-16 1/2 367-16 1/2 369-16 1/2 371-16 1/2 373-16 1/2 375-16 1/2 377-16 1/2 379-16 1/2 381-16 1/2 383-16 1/2 385-16 1/2 387-16 1/2 389-16 1/2 391-16 1/2 393-16 1/2 395-16 1/2 397-16 1/2 399-16 1/2 401-16 1/2 403-16 1/2 405-16 1/2 407-16 1/2 409-16 1/2 411-16 1/2 413-16 1/2 415-16 1/2 417-16 1/2 419-16 1/2 421-16 1/2 423-16 1/2 425-16 1/2 427-16 1/2 429-16 1/2 431-16 1/2 433-16 1/2 435-16 1/2 437-16 1/2 439-16 1/2 441-16 1/2 443-16 1/2 445-16 1/2 447-16 1/2 449-16 1/2 451-16 1/2 453-16 1/2 455-16 1/2 457-16 1/2 459-16 1/2 461-16 1/2 463-16 1/2 465-16 1/2 467-16 1/2 469-16 1/2 471-16 1/2 473-16 1/2 475-16 1/2 477-16 1/2 479-16 1/2 481-16 1/2 483-16 1/2 485-16 1/2 487-16 1/2 489-16 1/2 491-16 1/2 493-16 1/2 495-16 1/2 497-16 1/2 499-16 1/2 501-16 1/2 503-16 1/2 505-16 1/2 507-16 1/2 509-16 1/2 511-16 1/2 513-16 1/2 515-16 1/2 517-16 1/2 519-16 1/2 521-16 1/2 523-16 1/2 525-16 1/2 527-16 1/2 529-16 1/2 531-16 1/2 533-16 1/2 535-16 1/2 537-16 1/2 539-16 1/2 541-16 1/2 543-16 1/2 545-16 1/2 547-16 1/2 549-16 1/2 551-16 1/2 553-16 1/2 555-16 1/2 557-16 1/2 559-16 1/2 561-16 1/2 563-16 1/2 565-16 1/2 567-16 1/2 569-16 1/2 571-16 1/2 573-16 1/2 575-16 1/2 577-16 1/2 579-16 1/2 581-16 1/2 583-16 1/2 585-16 1/2 587-16 1/2 589-16 1/2 591-16 1/2 593-16 1/2 595-16 1/2 597-16 1/2 599-16 1/2 601-16 1/2 603-16 1/2 605-16 1/2 607-16 1/2 609-16 1/2 611-16 1/2 613-16 1/2 615-16 1/2 617-16 1/2 619-16 1/2 621-16 1/2 623-16 1/2 625-16 1/2 627-16 1/2 629-16 1/2 631-16 1/2 633-16 1/2 635-16 1/2 637-16 1/2 639-16 1/2 641-16 1/2 643-16 1/2 645-16 1/2 647-16 1/2 649-16 1/2 651-16 1/2 653-16 1/2 655-16 1/2 657-16 1/2 659-16 1/2 661-16 1/2 663-16 1/2 665-16 1/2 667-16 1/2 669-16 1/2 671-16 1/2 673-16 1/2 675-16 1/2 677-16 1/2 679-16 1/2 681-16 1/2 683-16 1/2 685-16 1/2 687-16 1/2 689-16 1/2 691-16 1/2 693-16 1/2 695-16 1/2 697-16 1/2 699-16 1/2 701-16 1/2 703-16 1/2 705-16 1/2 707-16 1/2 709-16 1/2 711-16 1/2 713-16 1/2 715-16 1/2 717-16 1/2 719-16 1/2 721-16 1/2 723-16 1/2 725-16 1/2 727-16 1/2 729-16 1/2 731-16 1/2 733-16 1/2 735-16 1/2 737-16 1/2 739-16 1/2 741-16 1/2 743-16 1/2 745-16 1/2 747-16 1/2 749-16 1/2 751-16 1/2 753-16 1/2 755-16 1/2 757-16 1/2 759-16 1/2 761-16 1/2 763-16 1/2 765-16 1/2 767-16 1/2 769-16 1/2 771-16 1/2 773-16 1/2 775-16 1/2 777-16 1/2 779-16 1/2 781-16 1/2 783-16 1/2 785-16 1/2 787-16 1/2 789-16 1/2 791-16 1/2 793-16 1/2 795-16 1/2 797-16 1/2 799-16 1/2 801-16 1/2 803-16 1/2 805-16 1/2 807-16 1/2 809-16 1/2 811-16 1/2 813-16 1/2 815-16 1/2 817-16 1/2 819-16 1/2 821-16 1/2 823-16 1/2 825-16 1/2 827-16 1/2 829-16 1/2 831-16 1/2 833-16 1/2 835-16 1/2 837-16 1/2 839-16 1/2 841-16 1/2 843-16 1/2 845-16 1/2 847-16 1/2 849-16 1/2 851-16 1/2 853-16 1/2 855-16 1/2 857-16 1/2 859-16 1/2 861-16 1/2 863-16 1/2 865-16 1/2 867-16 1/2 869-16 1/2 871-16 1/2 873-16 1/2 875-16 1/2 877-16 1/2 879-16 1/2 881-16 1/2 883-16 1/2 885-16 1/2 887-16 1/2 889-16 1/2 891-16 1/2 893-16 1/2 895-16 1/2 897-16 1/2 899-16 1/2 901-16 1/2 903-16 1/2 905-16 1/2 907-16 1/2 909-16 1/2 911-16 1/2 913-16 1/2 915-16 1/2 917-16 1/2 919-16 1/2 921-16 1/2 923-16 1/2 925-16 1/2 927-16 1/2 929-16 1/2 931-16 1/2 933-16 1/2 935-16 1/2 937-16 1/2 939-16 1/2 941-16 1/2 943-16 1/2 945-16 1/2 947-16 1/2 949-16 1/2 951-16 1/2 953-16 1/2 955-16 1/2 957-16 1/2 959-16 1/2 961-16 1/2 963-16 1/2 965-16 1/2 967-16 1/2 969-16 1/2 971-16 1/2 973-16 1/2 975-16 1/2 977-16 1/2 979-16 1/2 981-16 1/2 983-16 1/2 985-16 1/2 987-16 1/2 989-16 1/2 991-16 1/2 993-16 1/2 995-16 1/2 997-16 1/2 999-16 1/2 1001-16 1/2 1003-16 1/2 1005-16 1/2 1007-16 1/2 1009-16 1/2 1011-16 1/2 1013-16 1/2 1015-16 1/2 1017-16 1/2 1019-16 1/2 1021-16 1/2 1023-16 1/2 1025-16 1/2 1027-16 1/2 1029-16 1/2 1031-16 1/2 1033-16 1/2 1035-16 1/2 1037-16 1/2 1039-16 1/2 1041-16 1/2 1043-16 1/2 1045-16 1/2 1047-16 1/2 1049-16 1/2 1051-16 1/2 1053-16 1/2 1055-16 1/2 1057-16 1/2 1059-16 1/2 1061-16 1/2 1063-16 1/2 1065-16 1/2 1067-16 1/2 1069-16 1/2 1071-16 1/2 1073-16 1/2 1075-16 1/2 1077-16 1/2 1079-16 1/2 1081-16 1/2 1083-16 1/2 1085-16 1/2 1087-16 1/2 1089-16 1/2 1091-16 1/2 1093-16 1/2 1095-16 1/2 1097-16 1/2 1099-16 1/2 1101-16 1/2 1103-16 1/2 1105-16 1/2 1107-16 1/2 1109-16 1/2 1111-16 1/2 1113-16 1/2 1115-16 1/2 1117-16 1/2 1119-16 1/2 1121-16 1/2 1123-16 1/2 1125-16 1/2 1127-16 1/2 1129-16 1/2 1131-16 1/2 1133-16 1/2 1135-16 1/2 1137-16 1/2 1139-16 1/2 1141-16 1/2 1143-16 1/2 1145-16 1/2 1147-16 1/2 1149-16 1/2 1151-16 1/2 1153-16 1/2 1155-16 1/2 1157-16 1/2 1159-16 1/2 1161-16 1/2 1163-16 1/2 1165-16 1/2 1167-16 1/2 1169-16 1/2 1171-16 1/2 1173-16 1/2 1175-16 1/2 1177-16 1/2 1179-16 1/2 1181-16 1/2 1183-16 1/2 1185-16 1/2 1187-16 1/2 1189-16 1/2 1191-16 1/2 1193-16 1/2 1195-16 1/2 1197-16 1/2 1199-16 1/2 1201-16 1/2 1203-16 1/2 1205-16 1/2 1207-16 1/2 1209-16 1/2 1211-16 1/2 1213-16 1/2 1215-16 1/2 1217-16 1/2 1219-16 1/2 1221-16 1/2 1223-16 1/2 1225-16 1/2 1227-16 1/2 1229-16 1/2 1231-16 1/2 1233-16 1/2 1235-16 1/2 1237-16 1/2 1239-16 1/2 1241-16 1/2 1243-16 1/2 1245-16 1/2 1247-16 1/2 1249-16 1/2 1251-16 1/2 1253-16 1/2 1255-16 1/2 1257-16 1/2 1259-16 1/2 1261-16 1/2 1263-16 1/2 1265-16 1/2 1267-16 1/2 1269-16 1/2 1271-16 1/2 1273-16 1/2 1275-16 1/2 1277-16 1/2 1279-16 1/2 1281-16 1/2 1283-16 1/2 1285-16 1/2 1287-16 1/2 1289-16 1/2 1291-16 1/2 1293-16 1/2 1295-16 1/2 1297-16 1/2 1299-16 1/2 1301-16 1/2 1303-16 1/2 1305-16 1/2 1307-16 1/2 1309-16 1/2 1311-16 1/2 1313-16 1/2 1315-16 1/2 1317-16 1/2 1319-16 1/2 1321-16 1/2 1323-16 1/2 1325-16 1/2 1327-16 1/2 1329-16 1/2 1331-16 1/2 1333-16 1/2 1335-16 1/2 1337-16 1/2 1339-16 1/2 1341-16 1/2 1343-16 1/2 1345-16 1/2 1347-16 1/2 1349-16 1/2 1351-16 1/2 1353-16 1/2 1355-16 1/2 1357-16 1/2 1359-16 1/2 1361-16 1/2 1363-16 1/2 1365-16 1/2 1367-16 1/2 1369-16 1/2 1371-16 1/2 1373-16 1/2 1375-16 1/2 1377-16 1/2 1379-16 1/2 1381-16 1/2 1383-16 1/2 1385-16 1/2 1387-16 1/2 1389-16 1/2 1391-16 1/2 1393-16 1/2 1395-16 1/2 1397-16 1/2 1399-16 1/2 1401-16 1/2 1403-16 1/2 1405-16 1/2 1407-16 1/2 1409-16 1/2 1411-16 1/2 1413-16 1/2 1415-16 1/2 1417-16 1/2 1419-16 1/2 1421-16 1/2 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1589-16 1/2 1591-16 1/2 1593-16 1/2 1595-16 1/2 1597-16 1/2 1599-16 1/2 1601-16 1/2 1603-16 1/2 1605-16 1/2 1607-16 1/2 1609-16 1/2 1611-16 1/2 1613-16 1/2 1615-16 1/2 1617-16 1/2 1619-16 1/2 1621-16 1/2 1623-16 1/2 1625-16 1/2 1627-16 1/2 1629-16 1/2 1631-16 1/2 1633-16 1/2 1635-16 1/2 1637-16 1/2 1639-16 1/2 1641-16 1/2 1643-16 1/2 1645-16 1/2 1647-16 1/2 1649-16 1/2 1651-16 1/2 1653-16 1/2 1655-16 1/2 1657-16 1/2 1659-16 1/2 1661-16 1/2 1663-16 1/2 1665-16 1/2 1667-16 1/2 1669-16 1/2 1671-16 1/2 1673-16 1/2 1675-16 1/2 1677-16 1/2 1679-16 1/2 1681-16 1/2 1683-16 1/2 1685-16 1/2 1687-16 1/2 1689-16 1/2 1691-16 1/2 1693-16 1/2 1695-16 1/2 1697-16 1/2 1699-16 1/2 1701-16 1/2 1703-16 1/2 1705-16 1/2 1707-16 1/2 1709-16 1/2 1711-16 1/2 1713-16 1/2 1715-16 1/2 1717-16 1/2 1719-16 1/2 1721-16 1/2 1723-16 1/2 1725-16 1/2 1727-16 1/2 1729-16 1/2 1731-16 1/2 1733-16 1/2 1735-16 1/2 1737-16 1/2 1739-16 1/2 1741-16 1/2 1743-16 1/2 1745-16 1/2 1747-16 1/2 1749-16 1/2 1751-16 1/2 1753-16 1/2 1755-16 1/2 1757-16 1/2 1759-16 1/2 1761-16 1/2 1763-16 1/2 1765-16 1/2 1767-16 1/2 1769-16 1/2 1771-16 1/2 1773-16 1/2 1775-16 1/2 1777-16 1/2 1779-16 1/2 1781-16 1/2 1783-16 1/2 1785-16 1/2 1787-16 1/2 1789-16 1/2 1791-16 1/2 1793-16 1/2 1795-16 1/2 1797-16 1/2 1799-16 1/2 1801-16 1/2 1803-16 1/2 1805-16 1/2 1807-16 1/2 1809-16 1/2 1811-16 1/2 1813-16 1/2 1815-16 1/2 1817-16 1/2 1819-16 1/2 1821-16 1/2 1823-16 1/2 1825-16 1/2 1827-16 1/2 1829-16 1/2 1831-16 1/2 1833-16 1/2	



<b>Cross-Cut Saw Handles—</b>	
Atkins' No. 1 Loop, pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 9 and No. 4 Reversible, 18¢.	
Boynston's Loop Saw Handles, 50¢.	60¢
Champion.....	15¢
<b>Hangers—</b>	
Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England.....	60¢10¢10¢70¢
Samson Steel Anti-Friction.....	55¢
Orleans Steel.....	55¢
Hamilton Wrought Wood Track.....	55¢
U. S. Wood Track.....	55¢
Champion.....	60¢10¢
Rider and Wooster, Medina Yfg. Co.'s.....	70¢
list.....	70¢
Ollmax Anti-Friction.....	60¢
Umax Anti-Friction for Wood Track.....	55¢
Zenith for Wood Track.....	55¢
ed's Steel Arm.....	50¢
allenge, Barn Door.....	50¢
Sterling's Imp'ed (Anti-Friction).....	55¢10¢
Victor, No. 1, \$15.00; No. 2, \$15.00; No. 3, \$15.00.....	50¢25¢
Chertres.....	50¢25¢
Kidder's.....	50¢10¢50¢
The Boss.....	60¢10¢
Best Anti-Friction.....	60¢10¢
Duplex (Wood Track).....	60¢10¢
Terry's Pat., 4 in. 10.00; 5 in. 11.00.....	50¢25¢50¢10¢
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.00.....	50¢15¢
No. 6, \$18.00.....	60¢15¢
Wood Track Iron Clad, 7 ft. 10¢.....	50¢
Carrier Steel Anti-Friction.....	50¢50¢25¢
Architect, 7 set \$5.00.....	30¢
Eclipse.....	30¢10¢
Pell, 7 set \$4.50.....	30¢
Richards.....	30¢30¢10¢
Lane's Steel Anti-Friction.....	50¢
Ball Bearing Door Hanger.....	20¢10¢25¢10¢
Warner's Pat.....	20¢20¢10¢
Stearns' Anti-Friction.....	20¢20¢10¢
Stearns' Challenge.....	25¢10¢25¢10¢10¢
Fantless.....	40¢40¢5¢
American, 7 set \$4.00.....	30¢
Rider & Wooster, No. 1, 62¢; No. 2, 75¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Paragon, Nos. 5, 6, 7 and 8.....	20¢10¢
Crecent.....	60¢60¢10¢
Nickel, Malleable Iron and Steel.....	40¢
Scranton Anti-Friction Single Strap.....	39¢4¢
Scranton Anti-Friction Double Strap.....	40¢
Universal Anti-Friction.....	40¢
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00.....	40¢10¢40¢10¢
Star.....	40¢10¢40¢10¢
May.....	50¢25¢40¢10¢
Barry, \$6.00.....	40¢10¢
<b>Harness Snaps—</b>	
See Snaps.....	
<b>Hatchets—</b>	
list Jan. 1, 1888.....	35¢40¢
Isaiah Blood.....	35¢40¢
Hunt's Shingling, Lath and Claw.....	40¢25¢
Hunt's Broad.....	40¢25¢
Buffalo Hammer Co.....	40¢10¢50¢
Hurd's.....	40¢10¢50¢
Fayette R. Plumb.....	40¢10¢50¢
Wm. Mann, Jr.....	30¢40¢10¢
Underhill Edge Tool Co.....	40¢25¢40¢10¢
Underhill's, Haines and Bright.....	33¢4¢
C. Hammond & Son.....	40¢10¢50¢
Simmons.....	40¢10¢50¢
Peck's.....	40¢10¢40¢10¢25¢
Sargent & Co.....	50¢50¢25¢
Ten Eyck Edge Tool Co.....	40¢10¢40¢10¢25¢
Collins.....	10¢
Schulte, Lohoff & Co.....	50¢50¢25¢
<b>Hay and Straw Knives—</b>	
Lightning, Mfrs. price 75¢ \$18.00, 25¢ But jobbers frequently give extras.	
Gem.....	75¢ \$10
Wadsworth's.....	40¢75¢40¢10¢
Carter's Needle.....	75¢ \$10
Heath's.....	75¢ \$10
Auburn Hay, Com. and Spear Point.....	50¢
Auburn, Straw.....	40¢
Nolin's Hay.....	75¢ \$10.00
<b>Hinges—</b>	
<b>Wrought Iron Hinges</b>	
Strap and T.....	75¢25¢75¢10¢
Screw Hook and.....	6 to 12 in. 75¢ 8 to 14 in. 85¢ 14 to 20 in. 95¢ 20 to 24 in. 105¢ 24 to 30 in. 115¢ 30 to 36 in. 125¢ 36 to 42 in. 135¢ 42 to 48 in. 145¢ 48 to 54 in. 155¢ 54 to 60 in. 165¢ 60 to 66 in. 175¢ 66 to 72 in. 185¢ 72 to 78 in. 195¢ 78 to 84 in. 205¢ 84 to 90 in. 215¢ 90 to 96 in. 225¢ 96 to 102 in. 235¢ 102 to 108 in. 245¢ 108 to 114 in. 255¢ 114 to 120 in. 265¢ 120 to 126 in. 275¢ 126 to 132 in. 285¢ 132 to 138 in. 295¢ 138 to 144 in. 305¢ 144 to 150 in. 315¢ 150 to 156 in. 325¢ 156 to 162 in. 335¢ 162 to 168 in. 345¢ 168 to 174 in. 355¢ 174 to 180 in. 365¢ 180 to 186 in. 375¢ 186 to 192 in. 385¢ 192 to 198 in. 395¢ 198 to 204 in. 405¢ 204 to 210 in. 415¢ 210 to 216 in. 425¢ 216 to 222 in. 435¢ 222 to 228 in. 445¢ 228 to 234 in. 455¢ 234 to 240 in. 465¢ 240 to 246 in. 475¢ 246 to 252 in. 485¢ 252 to 258 in. 495¢ 258 to 264 in. 505¢ 264 to 270 in. 515¢ 270 to 276 in. 525¢ 276 to 282 in. 535¢ 282 to 288 in. 545¢ 288 to 294 in. 555¢ 294 to 300 in. 565¢ 300 to 306 in. 575¢ 306 to 312 in. 585¢ 312 to 318 in. 595¢ 318 to 324 in. 605¢ 324 to 330 in. 615¢ 330 to 336 in. 625¢ 336 to 342 in. 635¢ 342 to 348 in. 645¢ 348 to 354 in. 655¢ 354 to 360 in. 665¢ 360 to 366 in. 675¢ 366 to 372 in. 685¢ 372 to 378 in. 695¢ 378 to 384 in. 705¢ 384 to 390 in. 715¢ 390 to 396 in. 725¢ 396 to 402 in. 735¢ 402 to 408 in. 745¢ 408 to 414 in. 755¢ 414 to 420 in. 765¢ 420 to 426 in. 775¢ 426 to 432 in. 785¢ 432 to 438 in. 795¢ 438 to 444 in. 805¢ 444 to 450 in. 815¢ 450 to 456 in. 825¢ 456 to 462 in. 835¢ 462 to 468 in. 845¢ 468 to 474 in. 855¢ 474 to 480 in. 865¢ 480 to 486 in. 875¢ 486 to 492 in. 885¢ 492 to 498 in. 895¢ 498 to 504 in. 905¢ 504 to 510 in. 915¢ 510 to 516 in. 925¢ 516 to 522 in. 935¢ 522 to 528 in. 945¢ 528 to 534 in. 955¢ 534 to 540 in. 965¢ 540 to 546 in. 975¢ 546 to 552 in. 985¢ 552 to 558 in. 995¢ 558 to 564 in. 1005¢ 564 to 570 in. 1015¢ 570 to 576 in. 1025¢ 576 to 582 in. 1035¢ 582 to 588 in. 1045¢ 588 to 594 in. 1055¢ 594 to 600 in. 1065¢ 600 to 606 in. 1075¢ 606 to 612 in. 1085¢ 612 to 618 in. 1095¢ 618 to 624 in. 1105¢ 624 to 630 in. 1115¢ 630 to 636 in. 1125¢ 636 to 642 in. 1135¢ 642 to 648 in. 1145¢ 648 to 654 in. 1155¢ 654 to 660 in. 1165¢ 660 to 666 in. 1175¢ 666 to 672 in. 1185¢ 672 to 678 in. 1195¢ 678 to 684 in. 1205¢ 684 to 690 in. 1215¢ 690 to 696 in. 1225¢ 696 to 702 in. 1235¢ 702 to 708 in. 1245¢ 708 to 714 in. 1255¢ 714 to 720 in. 1265¢ 720 to 726 in. 1275¢ 726 to 732 in. 1285¢ 732 to 738 in. 1295¢ 738 to 744 in. 1305¢ 744 to 750 in. 1315¢ 750 to 756 in. 1325¢ 756 to 762 in. 1335¢ 762 to 768 in. 1345¢ 768 to 774 in. 1355¢ 774 to 780 in. 1365¢ 780 to 786 in. 1375¢ 786 to 792 in. 1385¢ 792 to 798 in. 1395¢ 798 to 804 in. 1405¢ 804 to 810 in. 1415¢ 810 to 816 in. 1425¢ 816 to 822 in. 1435¢ 822 to 828 in. 1445¢ 828 to 834 in. 1455¢ 834 to 840 in. 1465¢ 840 to 846 in. 1475¢ 846 to 852 in. 1485¢ 852 to 858 in. 1495¢ 858 to 864 in. 1505¢ 864 to 870 in. 1515¢ 870 to 876 in. 1525¢ 876 to 882 in. 1535¢ 882 to 888 in. 1545¢ 888 to 894 in. 1555¢ 894 to 900 in. 1565¢ 900 to 906 in. 1575¢ 906 to 912 in. 1585¢ 912 to 918 in. 1595¢ 918 to 924 in. 1605¢ 924 to 930 in. 1615¢ 930 to 936 in. 1625¢ 936 to 942 in. 1635¢ 942 to 948 in. 1645¢ 948 to 954 in. 1655¢ 954 to 960 in. 1665¢ 960 to 966 in. 1675¢ 966 to 972 in. 1685¢ 972 to 978 in. 1695¢ 978 to 984 in. 1705¢ 984 to 990 in. 1715¢ 990 to 996 in. 1725¢ 996 to 1002 in. 1735¢ 1002 to 1008 in. 1745¢ 1008 to 1014 in. 1755¢ 1014 to 1020 in. 1765¢ 1020 to 1026 in. 1775¢ 1026 to 1032 in. 1785¢ 1032 to 1038 in. 1795¢ 1038 to 1044 in. 1805¢ 1044 to 1050 in. 1815¢ 1050 to 1056 in. 1825¢ 1056 to 1062 in. 1835¢ 1062 to 1068 in. 1845¢ 1068 to 1074 in. 1855¢ 1074 to 1080 in. 1865¢ 1080 to 1086 in. 1875¢ 1086 to 1092 in. 1885¢ 1092 to 1098 in. 1895¢ 1098 to 1104 in. 1905¢ 1104 to 1110 in. 1915¢ 1110 to 1116 in. 1925¢ 1116 to 1122 in. 1935¢ 1122 to 1128 in. 1945¢ 1128 to 1134 in. 1955¢ 1134 to 1140 in. 1965¢ 1140 to 1146 in. 1975¢ 1146 to 1152 in. 1985¢ 1152 to 1158 in. 1995¢ 1158 to 1164 in. 2005¢ 1164 to 1170 in. 2015¢ 1170 to 1176 in. 2025¢ 1176 to 1182 in. 2035¢ 1182 to 1188 in. 2045¢ 1188 to 1194 in. 2055¢ 1194 to 1200 in. 2065¢ 1200 to 1206 in. 2075¢ 1206 to 1212 in. 2085¢ 1212 to 1218 in. 2095¢ 1218 to 1224 in. 2105¢ 1224 to 1230 in. 2115¢ 1230 to 1236 in. 2125¢ 1236 to 1242 in. 2135¢ 1242 to 1248 in. 2145¢ 1248 to 1254 in. 2155¢ 1254 to 1260 in. 2165¢ 1260 to 1266 in. 2175¢ 1266 to 1272 in. 2185¢ 1272 to 1278 in. 2195¢ 1278 to 1284 in. 2205¢ 1284 to 1290 in. 2215¢ 1290 to 1296 in. 2225¢ 1296 to 1302 in. 2235¢ 1302 to 1308 in. 2245¢ 1308 to 1314 in. 2255¢ 1314 to 1320 in. 2265¢ 1320 to 1326 in. 2275¢ 1326 to 1332 in. 2285¢ 1332 to 1338 in. 2295¢ 1338 to 1344 in. 2305¢ 1344 to 1350 in. 2315¢ 1350 to 1356 in. 2325¢ 1356 to 1362 in. 2335¢ 1362 to 1368 in. 2345¢ 1368 to 1374 in. 2355¢ 1374 to 1380 in. 2365¢ 1380 to 1386 in. 2375¢ 1386 to 1392 in. 2385¢ 1392 to 1398 in. 2395¢ 1398 to 1404 in. 2405¢ 1404 to 1410 in. 2415¢ 1410 to 1416 in. 2425¢ 1416 to 1422 in. 2435¢ 1422 to 1428 in. 2445¢ 1428 to 1434 in. 2455¢ 1434 to 1440 in. 2465¢ 1440 to 1446 in. 2475¢ 1446 to 1452 in. 2485¢ 1452 to 1458 in. 2495¢ 1458 to 1464 in. 2505¢ 1464 to 1470 in. 2515¢ 1470 to 1476 in. 2525¢ 1476 to 1482 in. 2535¢ 1482 to 1488 in. 2545¢ 1488 to 1494 in. 2555¢ 1494 to 1500 in. 2565¢ 1500 to 1506 in. 2575¢ 1506 to 1512 in. 2585¢ 1512 to 1518 in. 2595¢ 1518 to 1524 in. 2605¢ 1524 to 1530 in. 2615¢ 1530 to 1536 in. 2625¢ 1536 to 1542 in. 2635¢ 1542 to 1548 in. 2645¢ 1548 to 1554 in. 2655¢ 1554 to 1560 in. 2665¢ 1560 to 1566 in. 2675¢ 1566 to 1572 in. 2685¢ 1572 to 1578 in. 2695¢ 1578 to 1584 in. 2705¢ 1584 to 1590 in. 2715¢ 1590 to 1596 in. 2725¢ 1596 to 1602 in. 2735¢ 1602 to 1608 in. 2745¢ 1608 to 1614 in. 2755¢ 1614 to 1620 in. 2765¢ 1620 to 1626 in. 2775¢ 1626 to 1632 in. 2785¢ 1632 to 1638 in. 2795¢ 1638 to 1644 in. 2805¢ 1644 to 1650 in. 2815¢ 1650 to 1656 in. 2825¢ 1656 to 1662 in. 2835¢ 1662 to 1668 in. 2845¢ 1668 to 1674 in. 2855¢ 1674 to 1680 in. 2865¢ 1680 to 1686 in. 2875¢ 1686 to 1692 in. 2885¢ 1692 to 1698 in. 2895¢ 1698 to 1704 in. 2905¢ 1704 to 1710 in. 2915¢ 1710 to 1716 in. 2925¢ 1716 to 1722 in. 2935¢ 1722 to 1728 in. 2945¢ 1728 to 1734 in. 2955¢ 1734 to 1740 in. 2965¢ 1740 to 1746 in. 2975¢ 1746 to 1752 in. 2985¢ 1752 to 1758 in. 2995¢ 1758 to 1764 in. 3005¢ 1764 to 1770 in. 3015¢ 1770 to 1776 in. 3025¢ 1776 to 1782 in. 3035¢ 1782 to 1788 in. 3045¢ 1788 to 1794 in. 3055¢ 1794 to 1800 in. 3065¢ 1800 to 1806 in. 3075¢ 1806 to 1812 in. 3085¢ 1812 to 1818 in. 3095¢ 1818 to 1824 in. 3105¢ 1824 to 1830 in. 3115¢ 1830 to 1836 in. 3125¢ 1836 to 1842 in. 3135¢ 1842 to 1848 in. 3145¢ 1848 to 1854 in. 3155¢ 1854 to 1860 in. 3165¢ 1860 to 1866 in. 3175¢ 1866 to 1872 in. 3185¢ 1872 to 1878 in. 3195¢ 1878 to 1884 in. 3205¢ 1884 to 1890 in. 3215¢ 1890 to 1896 in. 3225¢ 1896 to 1902 in. 3235¢ 1902 to 1908 in. 3245¢ 1908 to 1914 in. 3255¢ 1914 to 1920 in. 3265¢ 1920 to 1926 in. 3275¢ 1926 to 1932 in. 3285¢ 1932 to 1938 in. 3295¢ 1938 to 1944 in. 3305¢ 1944 to 1950 in. 3315¢ 1950 to 1956 in. 3325¢ 1956 to 1962 in. 3335¢ 1962 to 1968 in. 3345¢ 1968 to 1974 in. 3355¢ 1974 to 1980 in. 3365¢ 1980 to 1986 in. 3375¢ 1986 to 1992 in. 3385¢ 1992 to 1998 in. 3395¢ 1998 to 2004 in. 3405¢ 2004 to 2010 in. 3415¢ 2010 to 2016 in. 3425¢ 2016 to 2022 in. 3435¢ 2022 to 2028 in. 3445¢ 2028 to 2034 in. 3455¢ 2034 to 2040 in. 3465¢ 2040 to 2046 in. 3475¢ 2046 to 2052 in. 3485¢ 2052 to 2058 in. 3495¢ 2058 to 2064 in. 3505¢ 2064 to 2070 in. 3515¢ 2070 to 2076 in. 3525¢ 2076 to 2082 in. 3535¢ 2082 to 2088 in. 3545¢ 2088 to 2094 in. 3555¢ 2094 to 2100 in. 3565¢ 2100 to 2106 in. 3575¢ 2106 to 2112 in. 3585¢ 2112 to 2118 in. 3595¢ 2118 to 2124 in. 3605¢ 2124 to 2130 in. 3615¢ 2130 to 2136 in. 3625¢ 2136 to 2142 in. 3635¢ 2142 to 2148 in. 3645¢ 2148 to 2154 in. 3655¢ 2154 to 2160 in. 3665¢ 2160 to 2166 in. 3675¢ 2166 to 2172 in. 3685¢ 2172 to 2178 in. 3695¢ 2178 to 2184 in. 3705¢ 2184 to 2190 in. 3715¢ 2190 to 2196 in. 3725¢ 2196 to 2202 in. 3735¢ 2202 to 2208 in. 3745¢ 2208 to 2214 in. 3755¢ 2214 to 2220 in. 3765¢ 2220 to 2226 in. 3775¢ 2226 to 2232 in. 3785¢ 2232 to 2238 in. 3795¢ 2238 to 2244 in. 3805¢ 2244 to 2250 in. 3815¢ 2250 to 2256 in. 3825¢ 2256 to 2262 in. 3835¢ 2262 to 2268 in. 3845¢ 2268 to 2274 in. 3855¢ 2274 to 2280 in. 3865¢ 2280 to 2286 in. 3875¢ 2286 to 2292 in. 3885¢ 2292 to 2298 in. 3895¢ 2298 to 2304 in. 3905¢ 2304 to 2310 in. 3915¢ 2310 to 2316 in. 3925¢ 2316 to 2322 in. 3935¢ 2322 to 2328 in. 3945¢ 2328 to 2334 in. 3955¢ 2334 to 2340 in. 3965¢ 2340 to 2346 in. 3975¢ 2346 to 2352 in. 3985¢ 2352 to 2358 in. 3995¢ 2358 to 2364 in. 4005¢ 2364 to 2370 in. 4015¢ 2370 to 2376 in. 4025¢ 2376 to 2382 in. 4035¢ 2382 to 2388 in. 4045¢ 2388 to 2394 in. 4055¢ 2394 to 2400 in. 4065¢ 2400 to 2406 in. 4075¢ 2406 to 2412 in. 4085¢ 2412 to 2418 in. 4095¢ 2418 to 2424 in. 4105¢ 2424 to 2430 in. 4115¢ 2430 to 2436 in. 4125¢ 2436 to 2442 in. 4135¢ 2442 to 2448 in. 4145¢ 2448 to 2454 in. 4155¢ 2454 to 2460 in. 4165¢ 2460 to 2466 in. 4175¢ 2466 to 2472 in. 4185¢ 2472 to 2478 in. 4195¢ 2478 to 2484 in. 4205¢ 2484 to 2490 in. 4215¢ 2490 to 2496 in. 4225¢ 2496 to 2502 in. 4235¢ 2502 to 2508 in. 4245¢ 2508 to 2514 in. 4255¢ 2514 to 2520 in. 4265¢ 2520 to 2526 in. 4275¢ 2526 to 2532 in. 4285¢ 2532 to 2538 in. 4295¢ 2538 to 2544 in. 4305¢ 2544 to 2550 in. 4315¢ 2550 to 2556 in. 4325¢ 2556 to 2562 in. 4335¢ 2562 to 2568 in. 4345¢ 2568 to 2574 in. 4355¢ 2574 to 2580 in. 4365¢ 2580 to 2586 in. 4375¢ 2586 to 2592 in. 4385¢ 2592 to 2598 in. 4395¢ 2598 to 2604 in. 4405¢ 2604 to 2610 in. 4415¢ 2610 to 2616 in. 4425¢ 2616 to 2622 in. 4435¢ 2622 to 2628 in. 4445¢ 2628 to 2634 in. 4455¢ 2634 to 2640 in. 4465¢ 2640 to 2646 in. 4475¢ 2646 to 2652 in. 4485¢ 2652 to 2658 in. 4495¢ 2658 to 2664 in. 4505¢ 2664 to 2670 in. 4515¢ 2670 to 2676 in. 4525¢ 2676 to 2682 in. 4535¢ 2682 to 2688 in. 4545¢ 2688 to 2694 in. 4555¢ 2694 to 2700 in. 4565¢ 2700 to 2706 in. 4575¢ 2706 to 2712 in. 4585¢ 2712 to 2718 in. 4595¢ 2718 to 2724 in. 4605¢ 2724 to 2730 in. 4615¢ 2730 to 2736 in. 4625¢ 2736 to 2742 in. 4635¢ 2742 to 2748 in. 4645¢ 2748 to 2754 in. 4655¢ 2754 to 2760 in. 4665¢ 2760 to 2766 in. 4675¢ 2766 to 2772 in. 4685¢ 2772 to 2778 in. 4695¢ 2778 to 2784 in. 4705¢ 2784 to 2790 in. 4715¢ 2790 to 2796 in. 4725¢ 2796 to 2802 in. 4735¢ 2802 to 2808 in. 4745¢ 2808 to 2814 in. 4755¢ 2814 to 2820 in. 4765¢ 2820 to 2826 in. 4775¢ 2826 to 2832 in. 4785¢ 2832 to 2838 in. 4795¢ 2838 to 2844 in. 4805¢ 2844 to 2850 in. 4815¢ 2850 to 2856 in. 4825¢ 2856 to 2862 in. 4835¢ 2862 to 2868 in. 4845¢ 2868 to 2874 in. 4855¢ 2874 to 2880 in. 4865¢ 2880 to 2886 in. 4875¢ 2886 to 2892 in. 4885¢ 2892 to 2898 in. 4895¢ 2898 to 2904 in. 4905¢ 2904 to 2910 in. 4915¢ 2910 to 2916 in. 4925¢ 2916 to 2922 in. 4935¢ 2922 to 2928 in. 4945¢ 2928 to 2934 in. 4955¢ 2934 to 2940 in. 4965¢ 2940 to 2946 in. 4975¢ 2946 to 2952 in. 4985¢ 2952 to 2958 in. 4995¢ 2958 to 2964 in. 5005¢ 2964 to 2970 in. 5015¢ 2970 to 2976 in. 5025¢ 2976 to 2982 in. 5035¢ 2982 to 2988 in. 5045¢ 2988 to 2994 in. 5055¢ 2994 to 3000 in. 5065¢ 3000 to 3006 in. 5075¢ 3006 to 3012 in. 5085¢ 3012 to 3018 in. 5095¢ 3018 to 3024 in. 5105¢ 3024 to 3030 in. 5115¢ 3030 to 3036 in. 5125¢ 3036 to 3042 in. 5135¢ 3042 to 3048 in. 5145¢ 3048 to 3054 in. 5155¢ 3054 to 3060 in. 5165¢ 3060 to 3066 in. 5175¢ 3066 to 3072 in. 5185¢ 3072 to 3078 in. 5195¢ 3078 to 3084 in. 5205¢ 3084 to 3090 in. 5215¢ 3090 to 3096 in. 5225¢ 3096 to 3102 in. 5235¢ 3102 to 3108 in. 5245¢ 3108 to 3114 in. 5255¢ 3114 to 3120 in. 5265¢ 3120 to 3126 in. 5275¢ 3126 to 3132 in. 5285¢ 3132 to 3138 in. 5295¢ 3138 to 3144 in.

**Melasses Gates—**

Stebbin's Pat.	70¢@70¢1/2
Stebbin's Genuine	60¢@10¢1/2
Stebbin's Tinned Ends	40¢1/2
Chase's Hard Metal	50¢1/2
Bush's	30¢
Lincoln's Pattern	70¢@70¢1/2
Wood's	30¢1/2

**Ross, 7 doz:**

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	60¢10¢1/2
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**Money Drawers—**

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	50¢10¢1/2
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**Muzzles—**

Safety	70¢ doz, \$3.00, 25¢
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**Nails, see Trade Report.**

Wire Nails, Papered.	
Card June 1, '89, base	\$2.40 @ \$2.50
Card Mfrs. list	70¢1/2
Wire Nails, Standard Penny.	
Card June 1, '89, base	\$2.40 @ \$2.50

**Nail Puller—**

Curtis Hammer	70¢ doz \$9.00
Giant, No. 1	70¢ doz \$30.00, 10¢
Fellcan	70¢ doz \$30.00, 25¢
Ross	70¢ doz \$30.00, 30¢
Lightning	70¢ doz \$21.00

**Nail Sets—**

Square	70¢ gr, \$4.00 @ \$4.25
Round	70¢ gr, \$3.25
Cannon's Diamond Point	70¢ gr, \$12.20

**Nut Crackers—**

Table (H. & B. Mfg. Co.)	40¢
Blake's Pattern	70¢ doz \$2.00, 10¢
Turner & Seymour Mfg. Co.	60¢

**Nuts—**

Nuts, off list Jan. 1, 1888: Square, Hex.	
Hot Pressed	5.4¢ 5.9¢
Cold Punched	5.4¢ 5.9¢
In lots less than 100 lb, 1 lb, add 1/4¢; 1-b boxes, add 1¢ to list.	

**Oakum—**

Government	70¢ 7 1/2¢ @ 8¢
U. S. Navy	70¢ 6¢ @ 7¢
Navy	70¢ 5¢ @ 6¢

**Oilers—**

Zinc and Tin	65¢ @ 65¢10¢
Brass and Copper	60¢10¢ @ 60¢10¢1/2
Malleable, Hammers, Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40	60¢
Malleable, Hammers, Old Pattern, same list	40¢
Prior's Pat. or "Paragon" Zinc	60¢10¢1/2
Prior's Pat. or "Paragon" Brass	60¢
Olmstead's Tin and Zinc	60¢
Olmstead's Brass and Copper	60¢
Broughton's Zinc	60¢
Broughton's Brass	60¢

**Packing, Steam—**

Standard	60¢10¢ @ 60¢10¢1/2
Extra	60¢10¢ @ 60¢10¢1/2
N. Y. B. & P. Co., Standard	60¢10¢1/2
N. Y. B. & P. Co., Empire	70¢
N. Y. B. & P. Co., Salamander	70¢
Jenkins' Standard	70¢ 65¢, 30¢

**Miscellaneous—**

American Packing	10¢ @ 11¢ 7¢
Russia Packing	14¢ 7¢
Italian Packing	15¢ @ 14¢ 7¢
Cotton Packing	15¢ @ 17¢ 7¢
Jute	7¢ @ 8¢ 7¢

**Padlocks—**

See Locks.	
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**Pails—**

Galvanized Iron—	
Quarts	10 12 14
Hills Light Weight, 7 doz.	\$2.75 3.00 3.25
Hills Heavy Weight, 7 doz.	3.00 3.25 3.75
Whiting's	2.75 3.00 3.25
Sidney Shephard & Co.	2.80 3.00 3.40
Iron Clad	2.75 3.00 3.25
Fire Buckets	2.75 3.25 3.50
Buckets, see Well Buckets.	

**Indurated Fibre Ware—**

Star Pails, 12 qt.	70¢ doz \$4.50
Fire, Stable and Milk, 14 qt.	70¢ doz \$5.35

**Standard Fibre Ware—**

Water Pails, 12 qt.	Plain, Dec'd \$4.00 \$4.50
Dairy Pails, 14 qt.	4.50 5.00
Fire Pails, No. 1, 12 qt.	5.00
Fire Pails, No. 2, 14 qt.	4.50

**Pencils—**

Faber's Carpenters'	high list 50¢
Faber's Round Gilt	70¢ gr \$5.25
Dixon's Lead	70¢ gr \$4.50
Dixon's Lumber	70¢ gr \$6.75
Dixon's Carpenters'	40¢10¢

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.	60¢
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**Picture Nails—**

Brass Head, Sargent's list	50¢10¢1/2
Brass Head, Combination list	50¢10¢1/2
Porcelain Head, Sargent's list	50¢10¢1/2
Porcelain Head, Combination list	40¢10¢1/2
Niles' Patent	40¢

**Pinking Irons—**

70¢ doz 65¢ net	
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**Pipe, Wrought Iron—**

List March 23, 1887.	
1 1/2 and under, Plain	52 1/2¢
1 1/2 and under, Galvanized	45¢
1 1/2 and over, Plain	65¢
1 1/2 and over, Galvanized	52 1/2¢
Boiler Tubes, Iron	
1 1/2 and under	57 1/2¢
2 in. to 2 1/2 in.	62 1/2¢
3 in. and larger	65¢

**Planes and Plane Irons—**

Wood Planes—	
Molding	50¢5¢ @ 50¢10¢
Bench, First Quality	60¢60¢5¢
Bench, Second Quality	60¢10¢ @ 60¢10¢1/2
Bailey's (Stanley B. & L. Co.)	40¢10¢

**Iron Planes—**

Bailey's (Stanley B. & L. Co.)	40¢10¢
Miscellaneous Planes (Stanley B. & L. Co.)	30¢10¢
Victor Planes (Stanley B. & L. Co.)	20¢10¢
Steele's Iron Planes	30¢10¢ @ 30¢10¢1/2
Meriden Mfg. Co.'s	30¢10¢ @ 30¢10¢1/2
Davis's Iron Planes	30¢10¢ @ 30¢10¢1/2

**Birmingham Plane Co.—**

Gage Tool Co.'s Self-Setting	30¢10¢
Chaplin's Iron Planes	40¢40¢5¢
Sargent's	30¢10¢ @ 30¢10¢1/2

**Plane Irons—**

Plane Irons	30¢10¢
Plane Irons, Butcher's	\$5.00 @ \$5.25 to 2
Plane Irons, Buck Bros.	30¢
Plane Irons, Auburn Tool Co., This	30¢
Plane	40¢

**Sandusky Tool Co.—**

Single and Cut	30¢
Double	40¢
L. & I. J. White	25¢

**Pliers and Nippers—**

Button's Patent	30¢10¢40¢
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.	20¢10¢30¢1/2
\$21.00 70¢ doz	20¢10¢30¢1/2
Humason & Beckley Mfg. Co.	50¢60¢10¢
Gas Pliers	60¢
Gas Pliers, Custer's Nickel Plated	60¢5¢
Eureka Pliers and Nippers	40¢
Russell's Parallel	25¢
P. S. & W. Cast Steel	50¢
P. S. & W. Tinnern's Cutting Nippers	add 6¢ dis 10¢

**Carew's Pat. Wire Cutters—**

Morrill's Parallel	70¢ doz \$12.00, 30¢5¢
Cronk's 8 in., \$15.00; 10 in. \$21.00.	40¢40¢5¢

**Plumbs and Levels—**

Regular List	70¢10¢ @ 70¢10¢1/2
Diaton's	45¢10¢
Pocket Levels	70¢10¢ @ 70¢10¢1/2
Davis Iron Levels	30¢
Davis' Inclinoimeters	10¢10¢

**Polish, Metal.**

Prestolline	20¢10¢
Krestoline Paste	33¢4¢
Gaston's Silver Compound	33¢4¢

**Pokes, Animal—**

Bishop's I. X. L.	70¢ doz \$5.50
Bishop's O. K.	70¢ doz \$5.50
Bishop's Pioneer	70¢ doz \$3.75
Bishop's American	70¢ doz \$3.00

**Poppers, Corn—**

Round or Square, 1 qt.	70¢ gr \$12.00 @ 15.00
Round or Square, 2 qt.	70¢ gr \$25.00 @ 28.00

**Post Hole and Tree Augers and Diggers—**

Samson Post Hole Digger	70¢ doz \$36.00
Fletcher Post Hole Augers	70¢ doz \$36.20
Eureka Diggers	70¢ doz \$16.00 @ 17.00
Lead's	70¢ doz \$8.00 @ 9.00
Vaughan's Post Hole Auger	70¢ doz \$13.00 @ 14.00
Kohler's Little Giant	70¢ doz \$18.00
Kohler's Hercules	70¢ doz \$15.00
Kohler's New Champion	70¢ doz \$15.00
Schneider	70¢ doz \$18.00
Ryan's Post Hole Diggers	70¢ doz \$24.00
Cronk's Post Bars	70¢ doz \$30.00
Gibbs Post Hole Digger	70¢ doz \$30.00, 50¢
Imperial	70¢ doz \$15.00

**Potato Parers—**

White Mountain	70¢ doz \$5.00 @ 5.50
Antrim Combination	70¢ doz \$5.00
Hoosier	70¢ doz \$13.50

**Pruning Hooks and Shears—**

Diaston's Combined Pruning Hook and Saw	70¢ doz \$18.00, 20¢10¢
Diaston's Pruning Hook	70¢ doz \$12.00, 20¢10¢
E. S. Lee & Co.'s Pruning Tools	40¢
Pruning Shears, Henry's Pat.	70¢ doz \$3.75 @ 4.00 net
Henry's Pruning Shears	70¢ doz \$4.25 @ 4.50 net
Wheeler, M. & C. Co.'s Combination	70¢ doz \$12.00, 20¢
Dunlap's Saw and Chisel	70¢ doz \$8.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	20¢

**Pulleys—**

Hot House, Awning, &c.	60¢10¢
Japanned Screw	60¢10¢
Brass Screw	60¢10¢
Japanned Slide	60¢10¢
Japanned Clothes Line	60¢10¢
Empire Sash Pulley	55¢60¢
Hay Fork, Solid Eye, \$4.00; Swivel	50¢10¢ @ 50¢10¢1/2
Hay Fork, "Anti-Friction," 5 in. Solid	50¢
Hay Fork, "F" Common and Pat.	50¢
Bushed	50¢
Hay Fork, Tarbox Pat. Iron	50¢
Hay Fork, Reed's Self-Lubricating	60¢
Shade Rack	45¢
Tackle Blocks	See Blocks
Moore's Anti-Friction 5 in. Wheel	70¢ doz \$12.00, 40¢

**Pumps—**

Cistern, Best Makers	50¢10¢ @ 60¢
Pitcher Spout, Best Makers	60¢10¢ @ 60¢
Pitcher Spout, Cheaper Goods	70¢10¢ @ 70¢10¢1/2

**Punches—**

Saddlers' or Drive, good	70¢ doz \$6.00 @ 65¢
Bemis & Call Co.'s Cast Steel Drive	50¢5¢
Bemis & Call Co.'s Springfield Socket	50¢5¢
Spring, good quality	70¢ doz \$2.50 @ 2.60
Spring, Leach's Pat.	15¢
Bemis & Call Co.'s Spring and Check	40¢
Solid Tinnern's	70¢ doz \$1.44, 55¢
Tinnern's Hollow Punches	30¢2¢
Rice Hand Punches	15¢
Avery's Revolving	40¢
Avery's Saw-Set and Punch. See Saw Sets.	

**Rail—**

Sliding Door, Wrt Bragg	70¢ 35¢
Sliding Door, Bronzed Wrt Iron	70¢ ft. 7¢
Sliding Door, Painted	70¢ foot 4¢, 40¢
Barn Door, Light, In.	1/4 1/2
Per 100 feet	\$2.00 2.50 3.10, 10¢
B. D. for N. E. Hangers	
Small. Med. Large.	
Per 100 feet	\$2.15 2.70 3.25 net
Terry's Wrought Iron	70¢ foot 4¢ @ 5¢
Victor Track Rail, 7 1/2 ft.	50¢10¢
Carrier Steel Rail	70¢ foot 4¢ @ 5¢
Moore's Wrought Iron	25¢

**Rakes—**

Cast Steel, Association goods	65¢
Cast Steel, outside goods	60¢10¢ @ 70¢
Malleable	70¢ @ 70¢1/2
Gibbs Lawn Rake	50¢10¢
Canton Lawn Rake	\$9.00, 50¢10¢
Fort Madison Prize Bow Rake and Peerless	65¢

**Fort Madison Steel Tooth Lawn Rake,**

\$6.00.	25¢
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**Razors—**

J. R. Torrey Razor Co.	20¢
Wostenholme and Butcher, \$10.00 to 2	10¢

**Razor Straps—**

Genuine Emerson	80¢60¢5¢
Imitation	70¢ doz \$2.00, 20¢10¢5¢
Torrey's	70¢ doz \$3.00
Bedger's Beland Com	70¢ doz \$4.00
Lamont Combination	70¢ doz \$4.00

**Rivets and Burrs—**

Iron, list Nov. 17, '87	50¢
Copper	50¢10¢ @ 60¢

**Rivet Sets.**

	50¢10¢
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**Rods—**

Stair, Brass	25¢2¢
Stair, Black Walnut	70¢ doz 40¢

**Rollers—**

Barn Door, Sargent's list	60¢10¢10¢
Acme Moore's Anti-Friction	55¢
Union Barn Door Roller	70¢

**Rope—**

Manufacturers' prices for large lots:	
Manila, 1/4 in. and larger	15¢ @ 15¢1/2
Manila, 1/2 in. and 3/4 in.	15¢ @ 15¢1/2
Manila, 1 in. and 1 1/2 in.	15¢ @ 15¢1/2
Manila, Tarred Rope	15¢ @ 15¢1/2
Manila, Hay Rope	15¢ @ 15¢1/2
Sisal, 1/4 inch and larger	12¢ @ 12¢1/2
Sisal, 1/2 in. and 3/4 in.	12¢ @ 12¢1/2
Sisal, 1 in. and 1 1/2 in.	12¢ @ 12¢1/2
Sisal, Hay Rope	12¢ @ 12¢1/2
Sisal, Medium Laid Yarn	11¢ @ 11¢1/2
Cotton Rope	15¢ @ 15¢1/2 net
Jute Rope	70¢ doz \$8¢

**Rules—**

Boxwood	30¢10¢10¢ @ 30¢10¢10¢1/2
Ivory	50¢50¢10¢
Starrett's Rules and Straight Edges	25¢10¢
Steel	25¢10¢

**Sad Irons—**

<b>Machine</b>	
Flat Head, Iron	55
Round Head, Iron	50
<b>Beach and Hand</b>	
Bench, Iron	55&10@55&10&10
Bench, Wood, Beech	50
Bench, Wood, Hickory	50
Hand, Wood	25&10@25&10&10
Lag, Blunt Point	75&10@75&10
Couch and Lag, Gimlet Point	75
Bed	25&10
Hand Rail, Sargent's	60&10@60&10
Hand Rail, H. & B. Mfg. Co.	70&10@70&10
Hand Rail, Am. Screw Co.	75
Jack Screws, Millers Falls list	50&10@50&10
Jack Screws, P. S. & W.	35
Jack Screws, Sargent	60&10@60&10
Jack Screws, Stearns	40&10@40&10
<b>Scroll Saws</b>	
Lester, complete, \$10.00	25
Rogers, complete, \$4.00	25
Barnes' Builders' and Cabinet Makers	25
\$15	25
Barnes' Scroll Saw Blades	35
<b>Scythe Snaths</b>	50&10
<b>Shears</b>	
American (Cast) Iron	75&10@75&10&10
Pruning. See Pruning Hooks and Shears	
Barnard's Lamp Trimmers	50
Tinners'	20&10
Seymour's, List, Dec. 1881	60&10@60&10&10
Heinrich's, List, Dec. 1881	60&10@60&10&10
Heinrich's Tailor's Shears	35
First quality S. Trimmers	80&10@80&10
Second quality C. S. Trimmers	80&10@80&10
<b>Acme Cast Shears</b>	10&10
<b>Diamond Cast Shears</b>	10
<b>Clippers</b>	
Victor Cast Shears	75&10@75&10&10
Howe Bros. & Hubbert, Solid Forged	40
Chicago Drop Forge & F. Co., Solid	80
Steel Forged	80
Clausen Shear Co., Japanned	70
Clausen Shear Co., Nickel, same list	70
<b>Sheaves</b>	
<b>Sliding Door</b>	
M. W. Co., list July, 1888	50&10@50&10
R. & E., list Dec. 18, 1885	55&10
Corbin's list	60&10@60&10
Patent Roller	75
Patent Roller, Hatfield's	75
Russell's Anti-Friction, list Dec. 18, 1885	60&10
Moore's Anti-Friction	50
<b>Sliding Shutter</b>	
R. & E. list Dec. 18, 1885	60&10@60&10
Sargent's list	60&10
Reading list	60&10@60&10
<b>Ship Tools</b>	
L. & I. J. White	20&10
Albertson Mfg. Co.	25
<b>Shoes, Horse, Mule, &amp;c.</b>	
<b>Horse</b>	
Burden's, Perkins', Phoenix, at factory	\$4.00
<b>Mule</b>	
Add \$1 per keg to above prices.	
<b>Ox, Wrought</b>	
Ton lots	50
1000 lb lots	50
500 lb lots	50
<b>Shot</b>	
(Eastern prices 2¢ off, cash, 5 days)	
Drop, 7 bag, 25 lb	\$1.16
Drop, 7 bag, 5 lb	29
Buck and Chilled, 7 25 lb bag	1.41
Buck and Chilled, 7 5 lb bag	.34
<b>Shovels and Spades</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885	30
Notes.—Jobbers frequently give 5¢ off extra on above	
Griffith's Black Iron	50&10
Griffith's S. S. R. Goods	20
Old Colony (Sanford Fork & Tool Co.)	20
St. Louis Shovel Co.	20&10@20&10
Hussey, Binns & Co.	15&10
Hubbard & Co.	20&10@20&10
Lehigh Mfg. Co.	20&10
Payne Pettibone & Son, list January, 1886	30
Bennington's (Lowman's Pat.)	30&10@30&10
Rowland's, Black Iron	50&10
Rowland's Steel	60&10@60&10
<b>Shovels and Tonges</b>	
Iron Head	60&10@60&10
Brass Head	60&10@60&10
<b>Skins, Thimble</b>	
Western list	75&10@75&10
Columbus Wrt. Steel, list Nov. 1, 1887	20
Coldbrookdale Iron Co.	50&10
Utica P. S. T. Skins	60
Utica Turned and Pitted	35
<b>Sieves</b>	
Buffalo Metallic, S. S. & Co.	50&10@50&10
Shaker (Barler's Pat.) Flour Sifters	50
Electric	50
Hunter's	50
Smith's Adjustable Sifters	50
Smith's Adjustable Milk Strainer	50
Smith's Adjustable T. & C. Strainer	50
<b>Sieves, Wooden Rim</b>	
Mesh 18, Nested, 7 doz.	70
Mesh 20, Nested, 7 doz.	85
Mesh 24, Nested, 7 doz.	1.00
<b>Slates</b>	
School, by case	40
<b>Snaps, Harness, &amp;c.</b>	
Ancor (T. & S. Mfg. Co.)	65
Fitch's (Bristol)	50&10
Hotchkiss	50
Andrews	50
Sargent's Patent Guarded	70&10@70&10
German, new list	40&10
Covert	50&10
Covert, New Patent	50&10
Covert, New P. E.	50&10
Covered Spring	60&10@60&10
<b>Soldering Irons</b>	
Covert's Adjustable, list Jan. 1, 1886	35&10

<b>Spoke Shaves</b>	
Iron	45
Wood	30
Bailey's (Stanley R. & L. Co.)	40&10
Stearns	20&10@20&10
<b>Spoke Trimmers</b>	
Bonney's	50
Ives, No. 1, \$15.00; No. 2, \$12.00	50
Douglas	20
<b>Spoons and Forks</b>	
<b>Tinned Iron</b>	
Basting, Cen. Stamp, Co.'s list	70&10
Solid Table and Tea, Cen. Stamp, Co.'s list	70&10
Buffalo S. S. & Co.	35&10
<b>Miscellaneous</b>	
Meriden Brit. Co., Rogers	50
C. Rogers & Bros.	50
Rogers & Bro.	50
Reed & Barton	50
Wm. Rogers Mfg. Co.	50&10
Simpson, Hall, Miller & Co.	50&10
Holmes & Edwards Silver Co.	50&10
L. Boardman & Son	50&10
<b>Holmes &amp; Edwards Silver Co.</b>	
No. 67 Mexican Silver	50&10
No. 30 Silver Metal	50&10
No. 24 German Silver	50&10
No. 50 Nickel Silver	50&10
No. 49 Nickel Silver	50&10
German Silver	50&10
German Silver, Hall & Elton	50&10
Nickel Silver	50&10
Britannia	50
Boardman's Nickel Silver	50
Boardman's Britannia Spoons, case	50
<b>Springs</b>	
Elliptic, Concord, Platform and Half	50
Roll	50
Cliff's Bolster Springs	25
<b>Squares</b>	
Steel and Iron	75&10@75&10
Nickel Plated	60&10@60&10
Try Square and T Bevels	10
Dixon's Try Square and T Bevels	45&10
Winterbottom's Try and Miter	30&10
Starrett's Micrometer Caliper Squares	25
Avery's Flush Bevel Squares	40
Avery's Bevel Protractor	50
<b>Standard Fibre Ware</b>	
Per Dozen	
Wash-Basins, 10 1/2 in.	\$2.00
Wash-Basins, 12 in.	2.25
Keelers, 1 1/4 in.	2.75
Cuspidors	4.00
Splittoons, "Daisy," 8 in.	4.00
Peck Measure	4.00
Half-peck Measure	3.50
See also Pails.	
<b>Staples</b>	
Fence Staples, Galvanized	Same price as F.B.W.
Fence Staples, Plain	See Trl. Rep.
<b>Steelyards</b>	40&10@50
<b>Stocks and Dies</b>	
Blacksmith's	30&10@30&10
Waterford's Goods	30&10@30&10
Butterfield's Goods	30&10@30&10
Lightning Screw Plate	25&10
Reece's New Screw Plates	35&10@35&10
<b>Stone</b>	
Hindostan No. 1, 3¢; Axe, 3¢; Slips	50
No. 1, 4¢	50
Sand Stone	50
Washita Stone, Extra	19&10
Washita Stone, No. 1	19&10
Washita Stone, No. 2	19&10
Washita Slips, No. 1, Extra	24&10
Washita Slips, No. 1	24&10
Arkansas Stone, No. 1, 4 to 6 in	1.50
Arkansas Stone, No. 1, 6 to 9 in	1.85
Turkey Oil Stone, 4 to 8 in.	40
Lake Superior Slips, Chase	31&10
Seneca Stone, Red Paper Brand	18&10
Seneca Stone, High Rounds	20&10
Seneca Stone, Small Whets	24&10
<b>Steve Polish</b>	
Joseph Dixon's	50
Gem	50
Gold Medal	50
Mirror	50
Lustro	50
Ruby	50
Rising Sun	50
Boydton's Noon Day	13.00
Parlor Pride Stove Enamel	50
Yates' Liquid, 2 3/4 10 gal.	80
Yates' Standard Paste Polish, 10 lb cans	15
Jet Black	50
Japanese	50
Firestone	50
Diamond O. K. Enamel	50
Bonnell's Liquid Stove Polish	50
Bonnell's Paste Stove Polish	50
Black Eagle Benzine Paste, 5 and 10 lb cans	12
Black Jack Water Paste, 5 and 10 lb cans	12
Nickel Plate Paste	50
<b>Tacks, Brads, &amp;c.</b>	
List, Jan. 2, 1888.—(Note.—Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet	80&10
Steel Carpet	80&10
Swedes Iron Carpet	80&10
American Iron Cut	75&10@75&10
Swedes Iron	75&10@75&10
Swedes Iron, Upholsterers	75&10@75&10
Tinned Swedes Iron	75&10@75&10
Tinned Swedes Iron, Upholsterers	75&10@75&10
Gimp and Lace	75&10@75&10
Tinned Gimp and Lace	75&10@75&10
Swedes Iron Trimmers	75&10@75&10
Swedes Iron Miners	75&10@75&10
Swedes Iron Bill Posters	75&10@75&10

<b>Swedes Steel (Swedes Iron price list)</b>	
Copper Tacks	50&10
Copper Finishing, Trunk and Clout	50&10
Nails	50&10
Finishing Nails	70&10@70&10
Trunk and Clout Nails	70&10@70&10
Tinned Trunk and Clout Nails	70&10@70&10
Basket Nails	70&10@70&10
Common and Patent Brads	70&10@70&10
Hungarian Nails	70&10@70&10
Chair Nails	70&10@70&10
Zinc Glaziers Points	50&10
Cigar Box Nails	50&10@50&10
Picture-Frame Points	50&10@50&10
Looking-Glass Tacks	50&10@50&10
Leathered Carpet	50&10@50&10
Brush Tacks	50&10@50&10
Shoe Finders, List Jan. 2, 1888	10&10
<b>Lining and Saddle Nails, List Jan. 1, 1888</b>	
Silvered	30&10@30&10
Japanned	20&10@20&10
Double-Pointed Tacks	50&10
Wire Carpet Nails	50&10
Wire Nails, see Nails, Wire	
Steel-Wire Brads, R. & E. Mfg. Co.'s list	50&10
<b>Tap Borers</b>	
Common and Rind	20&10
Ive's Tap Borers	20&10
Enterprise Mfg. Co.	20&10@20&10
Clark's	33&10
<b>Tapes, Measuring</b>	
American	25&10
Spring	25
Chesterman's, Regular list	25
<b>Thermometers</b>	
Tin Case	80&10@80&10
<b>Thimble Skins—See Skins</b>	
<b>Ties, Bale—Steel</b>	
Standard Wire, list	50&10@50&10
<b>Tinners' Shears, &amp;c.</b>	
Shears and Snips (P. S. & W.)	20&10
Punches, see Punches	
Snips, J. Mallinson & Co.	33&10
<b>Tinware</b>	
Stamped, Japanned and Plated, list Jan. 30 1887	75&10@75&10
<b>Tire Benders, Upsetters, &amp;c.</b>	
Stoddard's Lightning Tire Upsetters	15
Detroit Perfect Tire Bender	15
<b>Tobacco Cutters</b>	
Champion	20&10@20&10
Wood Bottom	50
All Iron	50
Nashua Lock Co.'s	50
Sargent's	50
Acme	50
<b>Transom Lifters</b>	
Wollensak's	
Class 3 and 4, Bronzed Iron	50
Class 3 and 4, Bronze Metal	25
Class 3 and 4, Brass	35
Skylight Lifters	35
Crown, Eagle and Shield	50
Reiter's, list Jan. 1, 1887	50
Bronzed Iron Rods	50&10@50&10
Brass, Real Bronze or Nickel Plate	30
Excelsior	50&10@50&10
Shaw's	50&10
Payson's Universal	40&10@40&10
<b>Traps</b>	
<b>Game</b>	
Newhouse	35&10@35&10
Onida Pattern	70&10@70&10
Game, Blake's Patent	40&10@40&10
<b>Mouse and Rat</b>	
Mouse Wood Choker	50
Mouse, Round Wire	50
Mouse, Cage Wire	50
Mouse, Catch-em-alive	50
Mouse, Bonanza	50
Mouse, Delusion	50
Rat, Decoy	50
Cyclone	50
Hotchkiss Metallic Mouse, 5-hole traps	50
In full cases	50
<b>Trowels</b>	
Lothrop's Brick and Plastering	25
Reed's Brick and Plastering	25
Disston's Brick and Plastering	25
Peace's Plastering	25
Clement & Maynard's	25
Rose's Brick	15&10
Brade's Brick	25
Worrall's Brick and Plastering	20
Garden	70
<b>Triers</b>	
Butter and cheese	25
<b>Trucks, Warehouse, &amp;c.</b>	
B. & L. Block Co.'s list	40
<b>Tubes, Boiler</b>	
See Pipe	
<b>Twine</b>	
Flax Twine	BC. B.
No. 12, 1/4 and 1/2 B. Balls	22
No. 18, 1/4 and 1/2 B. Balls	21
No. 24, 1/4 and 1/2 B. Balls	21
No. 30, 1/4 and 1/2 B. Balls	21
No. 36, 1/4 and 1/2 B. Balls	21
No. 42, 1/4 and 1/2 B. Balls	21
No. 48, 1/4 and 1/2 B. Balls	21
Chalk Line, Cotton, 1/4 B. Balls	21
Wool Line, Linen, 1/4 B. Balls	21
2-Ply Hemp, 1/4 and 1/2 B. Balls (Spring Twine)	11
3-Ply Hemp, 1 B. Balls	12
3-Ply Hemp, 1 1/2 B. Balls	11
Cotton Wrapping, 5 Balls to lb	15
2, 3, 4 and 5-Ply Jute, 1/4 B. Balls	8
Paper	13
Cotton Mops, 6, 9, 12 and 15 lb to doz.	18

<b>Vices</b>	
Solid Box	30&10@30&10
<b>Parallels</b>	
Fisher & Norris Double Screw	15&10
Stephens	25&10
Parker's	20&10
Wilson's	55
Howard's	40
Bonney's	40&10
Millers Falls	40&10@40&10
Trenton	40&10@40&10
Merrill's	15&10
Sargent's	60&10@60&10
Beckus and Union	40
Double Screw Leg	15&10
Prentiss	30&10
Simpson's Adjustable	40
Moore's	20
<b>Saw Vices</b>	
Bonney's, Nos. 2 & 3, \$15.00	40&10
Stearns	35&10@35&10
Stearns' Silent Saw Vices	30&10
Sargent's	50
Hopkins	50
Reading	40&10
Wentworth	50&10
Combination Hand Vices	50
Cowell Hand Vices	30
Bauer's Pipe Vices	10
<b>Wagon Boxes</b>	
Per b.	25
<b>Wagon Jacks</b>	
Daisy	25
<b>Washer Cutters</b>	
Smith's Pat.	50
Johnson's	50
Pony's, 7 doz Pol. \$14; Jap'd, \$16.00, 55¢	
Appleton's	50
Bonney's	30&10
<b>Washers</b>	
Size	1/2 5-16 3/8 1/2 5/8 3/4 7/8 1
Washers	7 5/8 4 1/2 5/8 3/4 5/8 3/4
In lots less than 200 lb, 5¢ add 1/4¢, 5-b boxes 1¢ to list.	
<b>Wedges</b>	
Iron	50
Steel	50
<b>Well Buckets, Galvanized</b>	
Hill's	50
Iron Clad	50
Whiting's Flat Iron Band	50
Whiting's Wired Top	50
<b>Well Wheels</b>	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
<b>Wire</b>	
<b>Iron</b>	
Market	40
Br. & Ann., Nos. 0 to 18	70&10@70&10
Cop'd, Nos. 0 to 18	70&10@70&10
Galv., Nos. 0 to 18	70&10@70&10
Tin'd, Tinned list Nos. 0 to 18	70&10@70&10
Stone	70&10@70&10
Br. and Ann'd, Nos. 18 to 18, 75¢	
Bright and Ann'd, Nos. 19 to 20, 75¢	
Br. and Ann'd, Nos. 27 to 38, 75¢	
Tinned	70&10@70&10
Tinned Broom Wire	70&10@70&10
Galvanized Fence	65
Annealed Fence, Nos. 8 and 9	75
Annealed Grape, Nos. 10 to 14	15&10
Brass, list Jan. 18, 1884	30
Copper, list Jan. 18, 1884	30
Barb Fence	See Trade Report
Wire on Spools	65
Malin's Steel and Tin'd Wire on Spools	65
Malin's Brass and Cop. Wire on Spools	30





# THE IRON AGE

THURSDAY, JUNE 27, 1889.

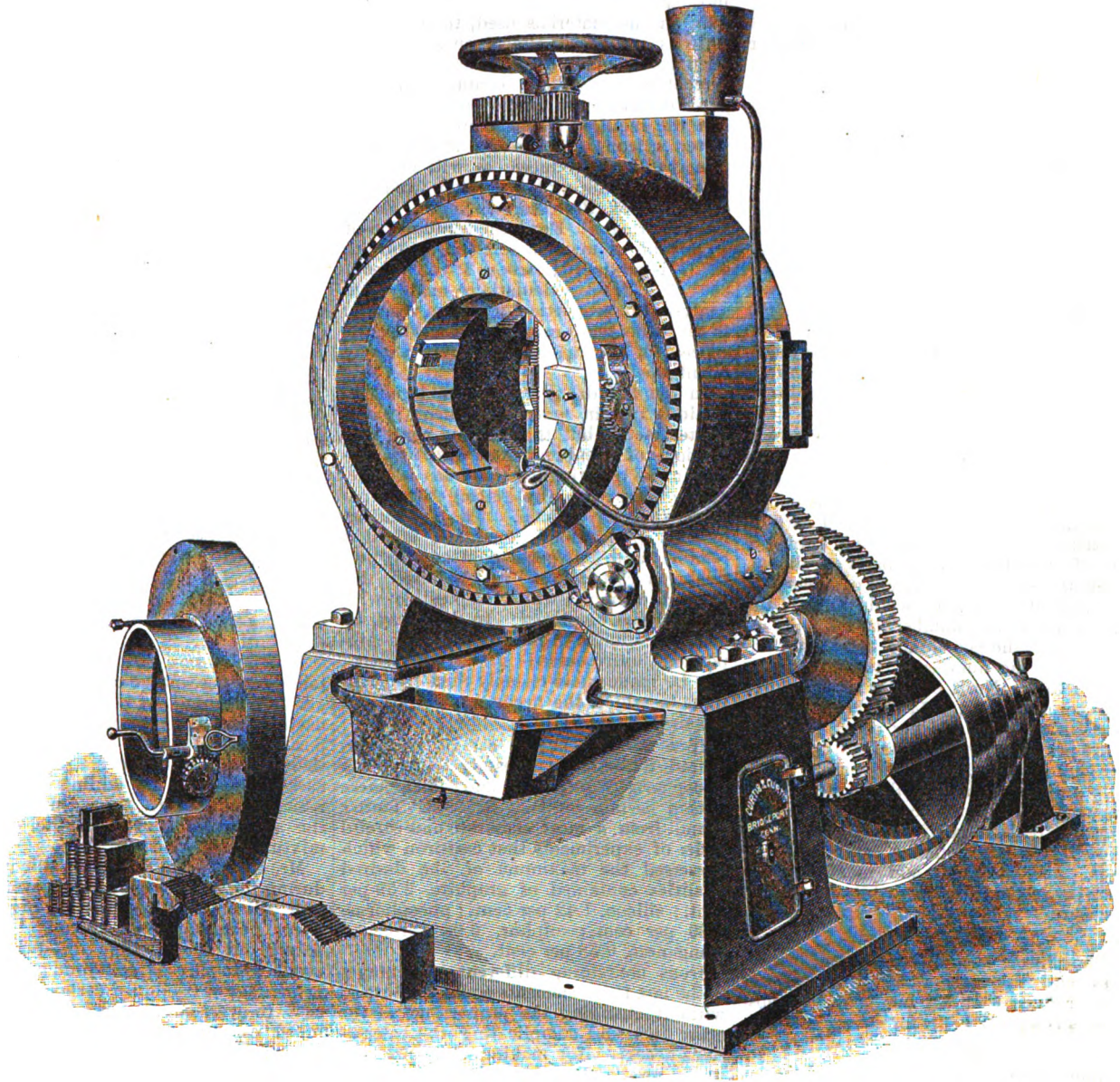
## Pipe-Cutting and Threading Machine.

A new pipe-cutting and threading machine, of which we present an engraving, has just been placed on the market by Curtis & Curtis, of Bridgeport, Conn. It is arranged to cut off and thread all sizes of wrought-iron pipe, from 2½ to 12 inches inclusive—a very unusual range. On ac-

In operating the machine the pipe is placed through the self-centering vise attached to the back of the shell, with the end against the back of the dies, and clamped securely by turning the hand-wheel shown on the top of the machine. The dies are all opening and adjustable to any variation of the fitting by means of cams behind the dies on an annular ring, and they are set for the size of pipe to be

cheaper than any other 12-inch power pipe machine in the market. The floor-space is 47 x 65 inches and the shipping weight 5800 pounds.

The example of the Cumberland Valley Railroad in using a car fitted with a dynamo and the necessary apparatus for electric lighting seems likely to be followed



NEW PIPE-CUTTING AND THREADING MACHINE, BUILT BY CURTIS & CURTIS.

count of the small amount of floor-space required long length of pipe can be handled in a much smaller room than is usually required. The general principle is the same as in the smaller sizes of pipe-machines for hand or power made by this firm. The die-carrying gear is supported in a casing with the pinion imbedded in its side. On the back of the gear is placed a lead-screw of the same number of threads to the inch as the pipe to be cut, which engages with the brass lead blocks shown on the side of the shell, and which work out or in by excentrics. Thus as the gear revolves in the shell it is drawn into the shell by the lead-screw and the dies are brought on to the pipe.

cut by simply revolving the ring to the graduation. The difficulties attending so great a range are overcome by using two die gearing rings which fit into the large gear. The larger one is shown in the machine and contains six dies for threading all sizes, from 7 to 12 inch inclusive. The smaller fixture is shown by the side of the machine and contains four dies for threading all sizes, from 2½ to 6 inches inclusive. A change from 2½ to 12 inch pipe is made in a few moments by changing the fixture and the jaw steels. The advantages claimed for this machine are that it has the largest range, requires less floor-room, takes less power to run it, is more simple in construction and is far

in the near future by other roads throughout the country. The car in question demonstrated its great usefulness recently in the work of repairing tracks and bridges. It was used by the Pennsylvania Railroad in building the temporary bridge at Montgomery and at other points along the line. It is 38 feet long, 9 feet wide and 13½ feet from the rails to the top of the roof. The boiler and engine are at one end and the dynamos at the other. The lamps and tools for erecting the line are carried under the car. The boiler is 40 horse-power and the engine is a 35 horse-power vertical automatic. The dynamos are of 25 and 15 arc-light capacity respectively, each lamp being of 2000 candle-power.

## Use of Softeners in Foundry Practice.

(Concluded from page 916, June 20.)

### SILICON.

Silicon is a softener of cast-iron. It promotes the production of graphitic carbon by replacing the carbon combined with the iron. By the proper use of silicon any proportion of combined carbon can be obtained that is required by the founder. It increases the fluidity of cast-iron. It prevents shrinkage by lessening the amount of combined carbon. Silicon prevents the formation of chilled castings in the same manner, it being difficult to get iron to chill deeply with silicon as high as 1.25 per cent.

Mr. A. E. Hammer has stated that "the carbon in iron containing less than 1.25 per cent. of silicon is surprisingly sensitive to the least increase or diminution of the silicon, even 0.02 per cent. making, under favorable conditions, an appreciable difference." In certain cases, he says, "the cast-iron may not have contained quite enough silicon to coax or force the combined carbon into the graphitic or semi-graphitic state, and the addition, under these circumstances, of 0.077 per cent. or even less of silicon would be expected to have altered very decidedly all the mechanical and many of the chemical conditions of the iron." Professor Turner finds that the percentage of silicon should be, for the greatest tensile strength, 1.80 per cent.; for softness and working qualities, 2.50 per cent., when the percentage of lowest combined carbon is under 5 per cent.

### SULPHUR.

Sulphur hardens the metal. It is very powerful in its action and acts in almost the contrary direction to silicon, as it promotes the formation of combined carbon, 1 part of sulphur neutralizing probably the effect of from 5 to 10 parts of silicon. Riley thinks that the "slight differences in the amount of sulphur would explain the differences in the number and quality of the iron, as the percentage of sulphur increases as the number of the pig passes from 1 to 6. No. 1 contains silicon, 2.619 per cent.; sulphur, 0.54 per cent.; No. 4 contains silicon, 2.234 per cent.; sulphur, 0.115 per cent.; white contains silicon, 0.27 per cent.; sulphur, 0.54 per cent.

It is observed that as silicon increases in pig-iron the sulphur decreases. In foundry irons the percentage of sulphur should not exceed for soft foundry irons 0.18 per cent., nor for hard and mottled irons 0.20 per cent., nor for white irons 0.25 per cent.

### PHOSPHORUS.

Phosphorus causes hardness and brittleness and increases fluidity. Professor Turner finds that 0.3 per cent. of phosphorus is a good figure for strong castings.

### MANGANESE.

Manganese tends to the formation of combined carbon in cast-iron and reduces the tensile strength. Manganiferous irons are brittle. As the manganese is increased the hardening properties are increased, since it acts in a contrary direction to silicon, and more powerfully in keeping the carbon in the combined state. M. Al. Pourcel, Terrenoire, states that silicon is neutralized by manganese when for each chemical equivalent of silicon there is a little more than an equivalent of manganese present. Silicon when neutralized by manganese does not diminish the hardening properties of the metal. M. Gautier found that the presence of manganese prevented mottled iron from becoming gray when scrap, burnt iron, ferro-silicon and No. 1 Scotch irons were melted together in a mixture.

Manganese is considered to make iron fluid, to take out the shrinkage of certain

irons, and to make clean castings. It protects the silicon during remelting from oxidation, and should therefore always be present to some extent, so that the iron by retaining its silicon may continue to be graphitic.

Professor Turner finds 0.58 per cent. manganese to be the best figure for strong castings. Dr. Dudley stated to me that as manganese hardens both foundry and car-wheel metal it increases the cost of boring and machining the castings; he therefore recommends that manganese be kept below 0.50 per cent. in foundry pig-iron.

### MIXTURES OF IRONS.

In the cupola practice of the Bessemer steel process for a given grade of steel, the proportions of phosphorus, sulphur and manganese being prescribed and constant in the materials used, the mixtures of irons are based almost entirely upon calculations made from analyses of the percentages of silicon contained in the pig-irons and scrap employed. To maintain the required temperature in the converter silicon is necessary, it being the principal heat-producer, as will be seen from the following table, taken from calculations by Professors Ledebur, Favre and Silbermann: From the combustion of 1 per cent. of manganese a temperature of 69° C. is produced; carbon, 8° C.; silicon, 300° C. From calculations made from analyses the proportion of silicon required to give the temperature necessary for the success of the operation is very exactly maintained.

In the foundry the problem is not to attain a certain amount of heat in the molten metal, but to have the right proportions of combined and graphitic carbon in the resulting casting; this is done, as we have seen, by getting the proper proportion of silicon. The variations in the proportions of silicon afford a reliable and inexpensive means of producing a cast-iron of any required mechanical character which is possible with the material employed. In this way, by mixing suitable irons in the right proportions, a required grade of casting can be made more cheaply than by using irons in which the necessary proportions are already found.

If a strong machine casting were required, it would be necessary to keep the phosphorus, sulphur and manganese within certain limits. Professor Turner found from a most elaborate and careful series of experiments that cast-iron which possessed the maximum of the desired qualities contained of graphite, 2.59 per cent.; silicon, 1.42 per cent.; phosphorus, 0.89 per cent.; sulphur, 0.06 per cent.; manganese, 0.58 per cent.

Irons containing different percentages of the last three elements could not be used without changing the proportions of the other two and complicating the calculations necessary for making a mixture that would produce a strong casting. A strong casting could not be made if there was much increase in the amount of phosphorus, sulphur or manganese. Irons of the above percentages of phosphorus, sulphur and manganese would be most suitable for this purpose, but they could be of different grades, having different percentages of silicon, combined and graphitic carbon. Thus hard irons, mottled and white irons, and even steel scrap, all containing low percentages of silicon and high percentages of combined carbon, could be employed if an iron having a large amount of silicon were mixed with them in sufficient amount. This would bring the silicon to the proper proportion and would cause the combined carbon to be forced into the graphitic state, and the resulting casting would be soft. High-silicon irons which are used in this way are called "softeners."

### HIGH-SILICON IRONS.

Mr. Keep gives the following analyses of high-silicon irons:

#### Ferro-Silicon.

	Foreign. Per cent.	Foreign. Per cent.	Foreign. Per cent.	American. Per cent.	American. Per cent.
Silicon.....	10.55	10.62	9.80	12.08	10.34
Combined carbon.....	1.84	...	0.69	0.06	0.07
Graphitic carbon.....	0.52	...	1.12	1.52	1.92
Manganese.....	3.86	2.32	1.95	0.76	0.52
Phosphorus.....	0.04	...	0.21	0.48	0.45
Sulphur.....	0.03	...	0.04	Trace	Trace
Total carbon.....	2.36	...	1.81	1.58	1.99

Average total carbon, 1.98 per cent.

#### Softeners—American.

	Wells- ton. Per cent.	Wells- ton. Per cent.	Globe. Per cent.	Globe. Per cent.
Silicon.....	6.67	5.06	5.99	6.64
Combined carbon.....	...	...	0.80	...
Graphitic carbon.....	2.57	...	2.85	...
Manganese.....	...	...	1.00	...
Phosphorus.....	0.50	0.75	1.10	0.99
Sulphur.....	Trace	0.06	0.02	Trace

Mr. Meissner gives the following analyses of Scotch irons:

	Silicon.	Phosphorus.	Manganese.	Sulphur.	Graphite.	Combined Carbon.
Summerlee No. 1.....	2.70	0.545	1.80	0.01	3.00	0.25
Summerlee No. 1.....	2.47	0.780	2.51	0.015	...	...
Summerlee No. 1.....	3.44	1.00	1.70	0.015	...	...
Summerlee No. 2.....	2.70	0.81	2.90	0.020	3.00	0.80
Eglinton No. 1.....	2.15	0.618	2.80	0.025	3.76	0.21
Cottbus No. 1.....	2.59	0.845	1.70	0.010	...	3.75(?)
Glengarnock No. 1.....	3.08	1.20	2.85	...	...	...
Glengarnock No. 2.....	4.00	0.90	3.40	0.01	1.78	0.90

I add the analysis of the Bellefonte soft irons as follows: Silicon, 3 to 6 per cent.; phosphorus, 0.845 per cent.; manganese, 0.58 per cent.; sulphur, 0.03 per cent.; graphite, 3 per cent.; combined carbon, 0.25 per cent.; total carbon, 3.25 per cent.

It will be seen that ferro-silicons contain a low percentage of total carbon and a high percentage of combined carbon. It has been stated that carbon is the most important constituent of cast-iron, and that there should be about 3.4 per cent. total carbon present. By adding ferro-silicon which contains only 2 per cent. of carbon the amount of carbon in the resulting mixture is lessened.

Mr. Keep found that more silicon is lost during the remelting of pig of over 10 per cent. silicon than in remelting pig-iron of lower percentages of silicon. He also points out the possible disadvantage of using ferro-silicons containing as high a percentage of combined carbon as 0.70 per cent. to overcome the bad effects of combined carbon in other irons. Professor Turner finds that the lowest percentages of combined carbon are met within iron containing from 4 to 7 per cent. of silicon, being from a trace to 2 per cent.

The Scotch irons generally contain much more phosphorus than is desired in irons to be employed in making the strongest castings. It is a mistake to mix with strong low-phosphorus irons an iron that would increase the amount of phosphorus for the sake of adding softening qualities, when softness can be produced by mixing irons of the same low phosphorus.

Bauermann states that the highly-graphitic Scotch pig-irons, while useless in themselves for producing castings, have a great use in bringing up lower qualities of metal to the proper degree of grayness in the cupola.

M. Gautier says that the high percentage of manganese in Scotch softeners makes them inferior to ferro-silicons; therefore,



he says, Scotch irons might be improved by keeping down the manganese to 0.50 per cent. and raising the silicon to 3 per cent.

Tensile strength is important in the best castings; manganese reduces the tensile strength and increases the capacity of iron for combining carbon with itself; therefore a reduction of manganese in Scotch irons will increase the strength of the metal and enable it to carry more scrap. He found that the presence of manganese prevented mottled iron from becoming gray when a mixture was made of scrap, burnt iron, ferro-silicon and No. 1 Scotch; hence, he says, if ferro-silicon had not been discovered a new variety of Scotch pig, with less manganese and more silicon, could easily be provided for, and would afford a new field to that renowned product; but he was afraid that ferro-silicon, which was the essence of the good qualities of Scotch pig without any of the bad ones, must come to the front in the future.

From the analyses of the Bellefonte softener it is seen that it contains all the

#### Portable Coal Elevators.

The accompanying illustration is that of a portable coal elevator constructed according to the methods employed by the Clark-Howard Excavator and Conveyor Company in coal-handling machinery, and is now in daily use at the coal wharves of the Philadelphia and Reading Railroad Company at Port Richmond, Philadelphia. The machine has a lift of 80 feet, an adjustment of 16 feet and a capacity of 300 tons per hour. It is built on an ordinary flat gondola car, with a simple hoisting engine and boiler of about 15 horse-power attached, and consists of an arrangement of 30 buckets attached to an endless chain at stated intervals, which passes around a system of wheels. Each bucket holds about 250 pounds of coal. The entering edge of the bucket, where it passes into the coal pile, is fitted with prongs which project ahead, so that instead of crushing into the coal and breaking its way, it gently loosens the coal and scoops it up. The manner in

force of manual labor which is unreliable and expensive. The breakage is reduced to a minimum and is less than that caused by handling by hand. The theory employed in this machine is to handle a large amount of coal at a slow rate of speed, thereby gathering and depositing the coal so slowly and carefully that it becomes impossible to break it; and instead of flinging the coal out at a great height upon a pile beneath, the door of each bucket opens from the back and the coal slides gently out, the motion being that of drawing the bucket away from the coal. This machine has proved to the satisfaction of those in charge of the Philadelphia and Reading coal-yards that it handles coal cheaper, quicker and more securely than ever before. This machine is made by the Clark-Howard Excavator and Conveyor Company, of 135 Broadway, New York, and Third and Walnut streets, Philadelphia, Pa.

#### The Cooper Union.

The thirteenth annual report of the trustees of the Cooper Union for the Advancement of Science and Art, New York, has just been issued. It comprises a pamphlet of 68 pages. We extract the following interesting statement:

The trustees have heretofore made known to the public the necessities of the institution, and they can now only repeat that additions to the endowment fund will be most acceptable, and, indeed, are absolutely necessary, in order to meet the constantly increasing pressure for admission to the various privileges of the institution. The applications to the art school are more than a year in advance of the possibilities of admission. If the school were double in size it would promptly be filled by the applicants for admission. The other departments of the institution, especially the night classes, are crowded to their full capacity and require enlargement. The space exists in the building, but the funds are deficient for the necessary expenses. To bring the institution up to the full measure of its capacity an endowment of \$1,000,000 will not be too much. In the meantime the trustees will henceforth be compelled to keep the expenditures within the income which can be got from the rented portions of the institution and the annual interest of the endowment of \$300,000 provided by the heirs of Mr. Cooper. During the past year the number of pupils has been:

	Students.
In the woman's art school.....	310
In the phonography and type-writing class.....	50
In the telegraphy class.....	84

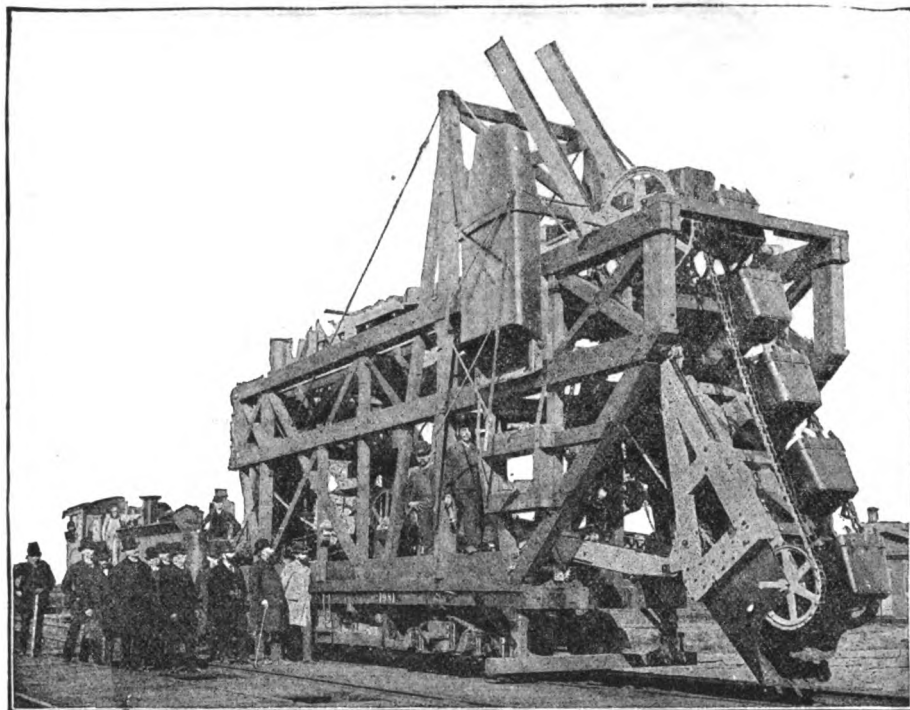
Total female day scholars.....394

In the night school of science.....	980
In the night school of art.....	2,147

Total male night scholars.....3,127

The average daily attendance at the reading-room amounts to 1500 readers. The free lectures on Saturday evening have attracted very large audiences, often exceeding the capacity of the great hall. These figures serve to give an idea of the magnitude of the educational work carried on by the Cooper Union.

We have received a copy of the proceedings of the first session of the National Convention of the Representatives of Commercial Bodies to formulate an equitable uniform bankrupt law, held pursuant to call of the Associated Wholesale Grocers of St. Louis, February 28 and March 1, 1889, at St. Louis. The proceedings are published in a broad-paged pamphlet of 100 pages. The last page of the cover contains a full list of the officers of the convention, headed by Jay L. Torrey, of St. Louis, president.



PORTABLE COAL ELEVATOR.

good qualities of both ferro-silicon and Scotch pig, without any of the bad ones of either. Silicious ores from the Barrens group of Centre County (the section from which the Bellefonte Furnace Company's ores come), containing as high as 40 per cent. of silica, have been shipped in large quantities to furnaces in Ohio making a specialty of softeners.

Desiring what many furnace men have expressed themselves in favor of, that iron should be bought and sold on analyses, I have undertaken to furnish the analysis of all shipments of iron made when asked for, and to furnish iron of the above proportions of phosphorus, sulphur and manganese, and of any percentage of silicon asked for below 6 per cent. I have even met the foundry men more than half way, undertaking to analyze their irons and scrap on hand, and to furnish an iron that would carry the amount of scrap and hard iron that they desire to use.

WALTER GRAHAM,  
Chemist of the Bellefonte Furnace Company and Member of the American Institute of Mining Engineers and of the Verein Deutscher Eisenhüttenleute.  
BELLEFONTE, PA., May 31, 1889.

which the machine performs its work is this: It is placed upon trestles over coal piled beneath, an engineer and two attendants being all the manual labor necessary to operate the machine. The boot with the chain of buckets is lowered into the hatch between the trestles. The endless chain begins to move, when the bucket nearest the coal enters gently and slowly into the mass, preceded by the prongs, which loosen and scoop it up. The chain revolving draws bucket after bucket through the coal at the slow speed of 75 feet per minute. The chain passes the buckets up the perpendicular to the top wheel, at which point a trip-wheel is also located, which strikes a latch in the back of the bucket, the door opens and the coal slides gently into a chute situated a little below the course taken by the buckets and thence on into cars drawn up on either side on the adjacent tracks. The bucket continues now empty until it reaches another wheel, where it is similarly closed and proceeds downward, to be refilled and emptied as before.

The advantages derived from handling coal in this manner are all primary and important. It does away with that large



### The Puritan.

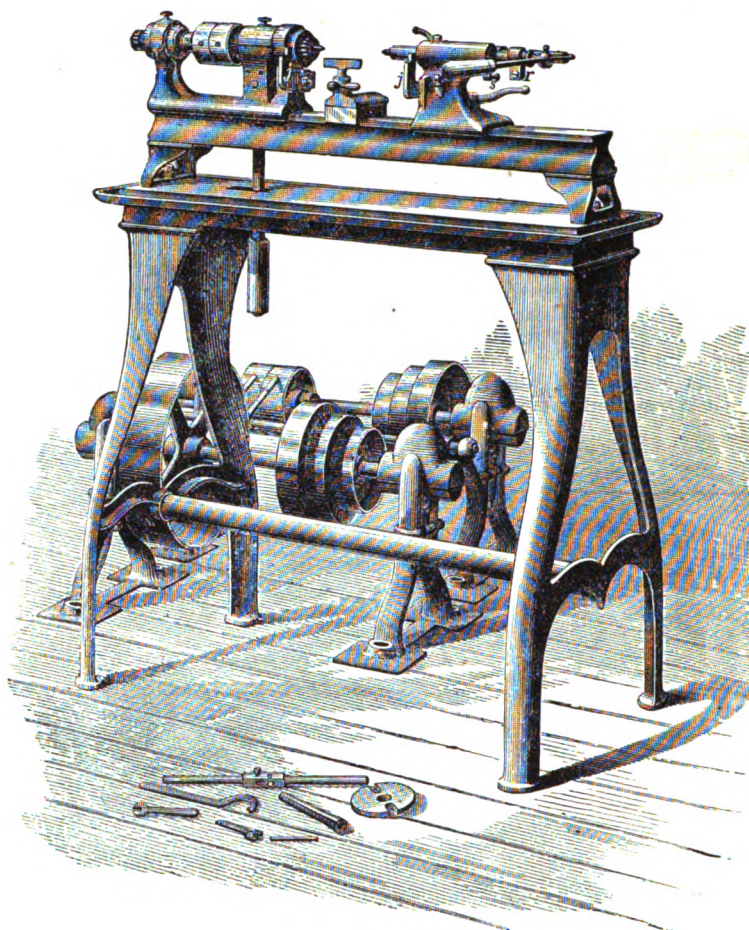
The Puritan, which is without doubt the grandest river steamboat in the world, has taken her place in the fleet of the Fall River Line and will, in the future, ply between New York and Fall River. Her most important dimensions are: Length over all, 420 feet; length on water-line, 404 feet; width, 52 feet; depth, 21½ feet; gross tonnage, 4650 tons. The steel hull is double and is divided into 59 water-tight compartments; the decks are also of steel, covered with wood. The masts are hollow and will serve as ventilators. The engine is of the compound vertical beam surface condensing type, and develops 7500 horsepower. The high-pressure cylinder is 75 inches in diameter and 9 feet stroke, and the low pressure is 110 inches diameter and 14 feet stroke. The shaft is 27 inches in diameter in the main bearing and 30 inches in the gunwale bearings. There are eight return tubular steel boilers, carrying a pressure of 110 pounds. The boilers have 850 square feet of grate surface and 26,000 square feet of heating surface. The fire-room is 78 x 12½ feet. The vessel is steered by steam, a two-cylinder engine being provided for this purpose. The extreme upper deck has a promenade entirely around it; this walk is over 600 feet long and 42 feet above the water. On the saloon deck is a second promenade entirely around the boat. The cabins are all extremely large and richly decorated and furnished. The main saloon is 128 x 28 feet and the dining-room 108½ x 30 feet. The steamer is lighted by electricity and every known precaution has been taken to guard against fire.

### Universal Hand-Lathe.

The Brown & Sharpe Mfg. Company, of Providence, R. I., have just issued a pamphlet on the construction and use of the universal hand-lathe made by them. The pamphlet describes and illustrates

fastened to the bed by a clamp-screw, and can be easily shifted or taken from the bed; its spindle moves in a steel bushing and is operated by a hand-lever which has its fulcrum on an adjustable stud back of the spindle. This spindle may be clamped

to ¼ inch in diameter. The tapering portion of the hole is ground. A thread to receive a face-plate or lathe-chuck is cut on the front end of the spindle, and when not in use is protected by a guard-nut. The spindle-boxes are fitted into taper



UNIVERSAL HAND-LATHE.

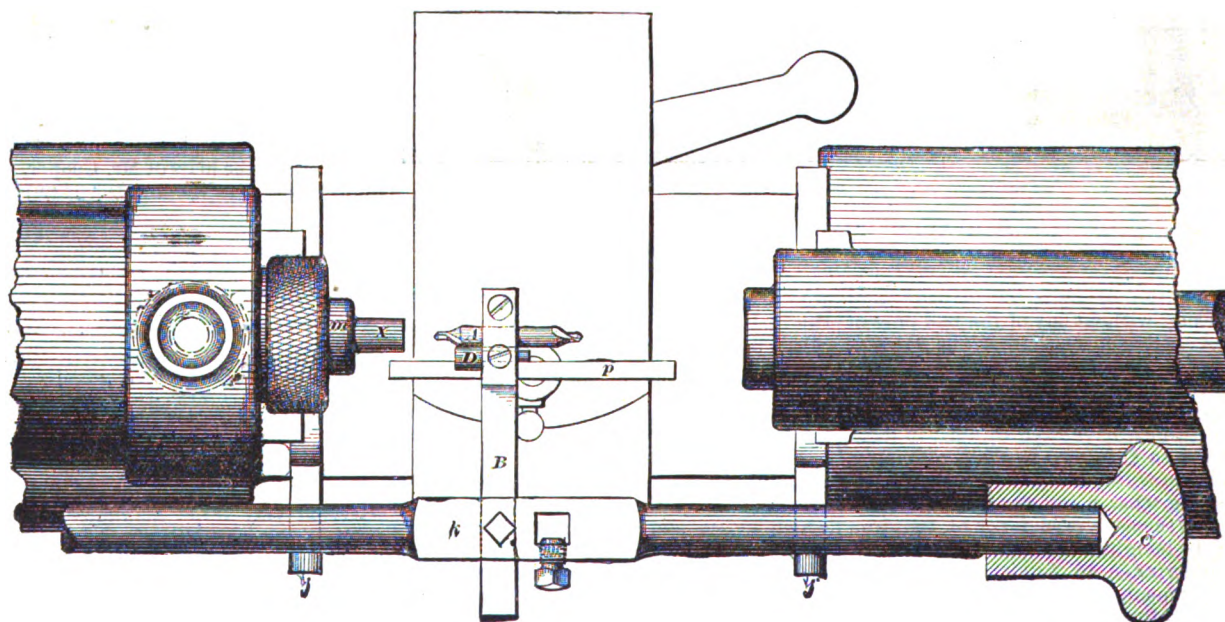


Fig. 3.—Method of Centering Bars and Shafts.

many new attachments designed for work not usually done on the hand-lathe.

As here shown, the lathe rests upon a table, but it is frequently used as a bench-lathe. The top of the bed is flat and is scraped to surface-plate, as are also the bearing surfaces of the foot-stock and the slide or other rests. The foot-stock is

in any position and has a movable stop, *r*, Fig. 1, which serves to limit the forward motion when brought against the adjustable stop-screw *s*. The head-stock, spindle and boxes are steel, hardened and fitted by grinding. The hole through the spindle is ¼ inch in diameter the greater part of its length and tapers at the front

holes in the head-stock and held in place by nuts. On one side they are cut open and, when adjusted, are drawn forward by nuts and practically closed from all sides. The alignment of the spindle is thus preserved. The spindle bearings are thoroughly protected from grit and dust and are lubricated from beneath. Shell-chucks



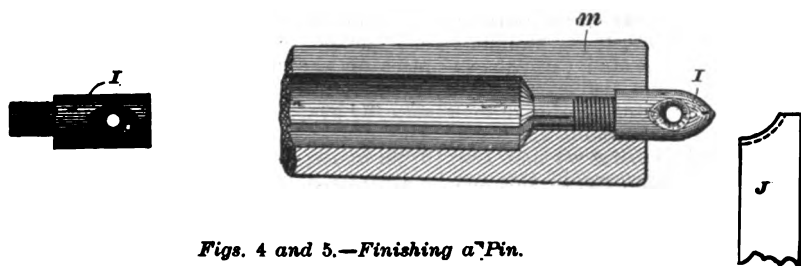
are provided for holding small work. These chucks are made in a great variety of forms, as required by the shape of the work. The tool-holder guides *j j* on the head and foot stock, Fig. 1, may be set in or out and enable the lathe to be used for turning small shafts, studs, screws, &c.,

cap, C, which is slipped over the end of the tool-holder. The pin D, in the drill-holder B, serves as a stop in connection with the end of the shaft, and determines the depth of the hole.

In finishing a pin, I, Figs. 4 and 5, a special chuck is used, which grips the

is removed by the tool T, and the edge S is rounded with a bead tool, J. The pin U is a stop to regulate the depth of the cap by coming in contact with the inside surface V. The tools and pin are held in the tool-holder shown in Fig. 3, the tools being at right angles to each other. These caps are also bitted and countersunk in the hand-lathe, and when riveted to a stem the burr is turned off with a hand-tool.

The ends of a great many odd-shaped pins are rounded as at M, Fig. 7. This cannot be done with the arrangement of tools before described on account of the projecting part; accordingly the tool is held in a collet, which is inserted in the foot-stock spindle. The work is held on



Figs. 4 and 5.—Finishing a Pin.

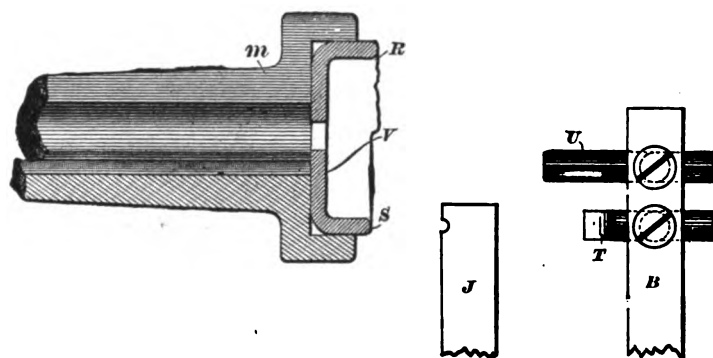


Fig. 6.—Finishing Small Caps.

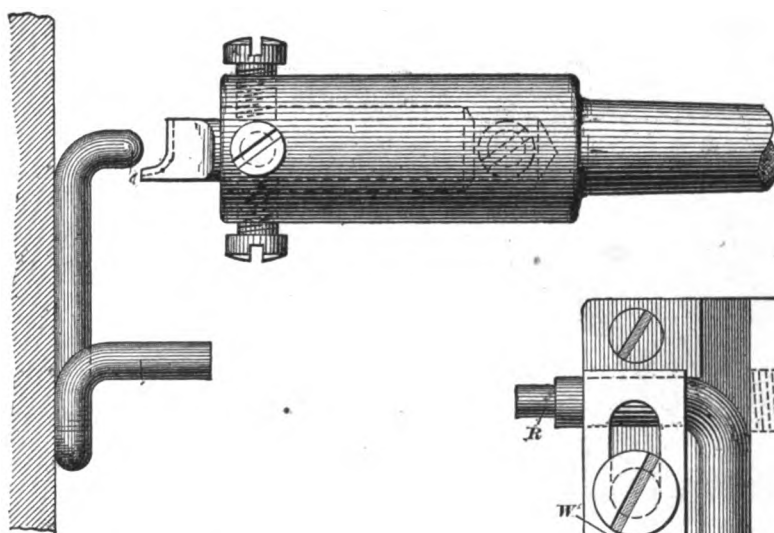


Fig. 7.—Rounding Ends.

either straight or taper. The lathe swings 9 inches over bed and receives 14 inches between centers. The bed is 36 inches long. The table or stand on which the bed rests is 12 x 40 inches, measured over all. Height of table from floor, 34½ inches; height of centers from floor, 44½ inches; floor-space, measured over extreme points of movement of lever on foot-stock, 25 x 58 inches. The weight of the lathe complete ready for shipment is about 500 pounds.

The tool-rest shown in plan in Fig. 2 can be clamped to the bed at any angle and can also be adjusted vertically.

Fig. 3 shows a method of centering needle-bars, foot-bars, shafts, &c. The drill A is fastened in the drill-holder B, which is secured in the tool-holder k. The tool-holder slides on the guides *j j*, and the outer end of the drill-holder slides upon the tool-rest *p*. The shaft X, to be centered, is held in a shell-chuck, *m*, while the drill is pressed against it by hand, the palm bearing on a wooden

body and closes about the thread of the pin just enough to steady and hold it in line. The pin could not be held by the thread alone without damage, and the body is too short to admit of its being held by that alone. To use an ordinary chuck for such work would be comparatively slow and costly.

A method of finishing small caps is shown by Fig. 6. These caps come to the hand-lathe from the punch press in the form shown at R. The superfluous stock

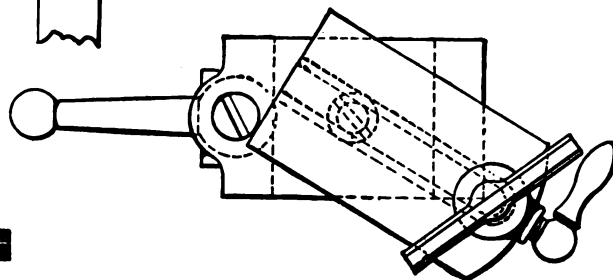


Fig. 2.—Tool-Rest.

a face-plate, and the end located centrally by a clamp and stop-pins. The length is regulated by adjusting the stop and stop-screw, which limit the forward movement of the foot-stock spindle. The four screws are used to adjust the tool when it is worn or ground. Sometimes it is more convenient that the tool should be held in the live spindle and the work secured to the dead spindle, as in turning the shoulders R and S, Fig. 8. The piece is held by the clamp W in a groove on a special fixture, U, and is moved to a hollow mill by the hand-lever.

C. P. Huntington, of American railway celebrity, has become interested in the Congo railway, 230 miles in length, to be built around the falls of the Congo River,

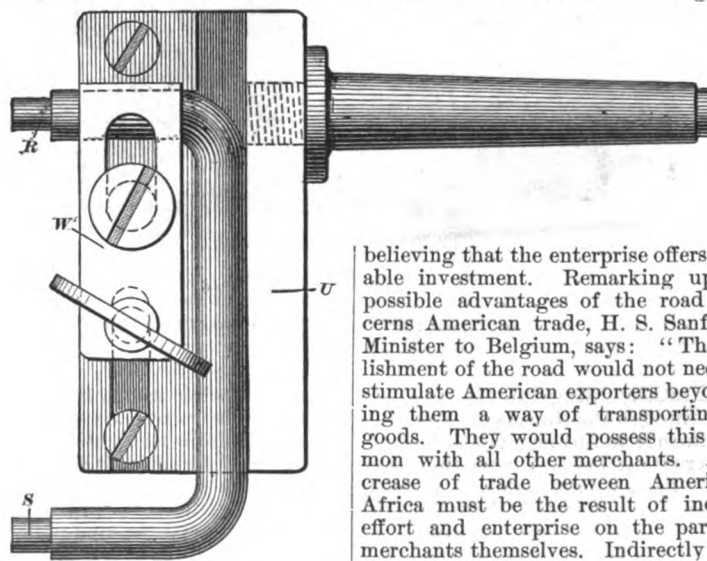


Fig. 8.—Rounding Ends.

believing that the enterprise offers a profitable investment. Remarking upon the possible advantages of the road as concerns American trade, H. S. Sanford, ex-Minister to Belgium, says: "The establishment of the road would not necessarily stimulate American exporters beyond giving them a way of transporting their goods. They would possess this in common with all other merchants. Any increase of trade between America and Africa must be the result of individual effort and enterprise on the part of the merchants themselves. Indirectly the fact that American capital was interested, were this the case, might direct the attention of Americans to the field and in this way increase the commerce of this country. It is quite within the range of probability that if the road were finished some of our manufacturers would endeavor to take advantage of it and try to find a market for their goods along the Upper Congo and its tributaries. Apart from this, however, I do not see why the road should not pay on the freights it would secure. The articles we get from Africa now are sufficiently valuable to stand heavy freight charges."

**Automatic Testing-Machine.**

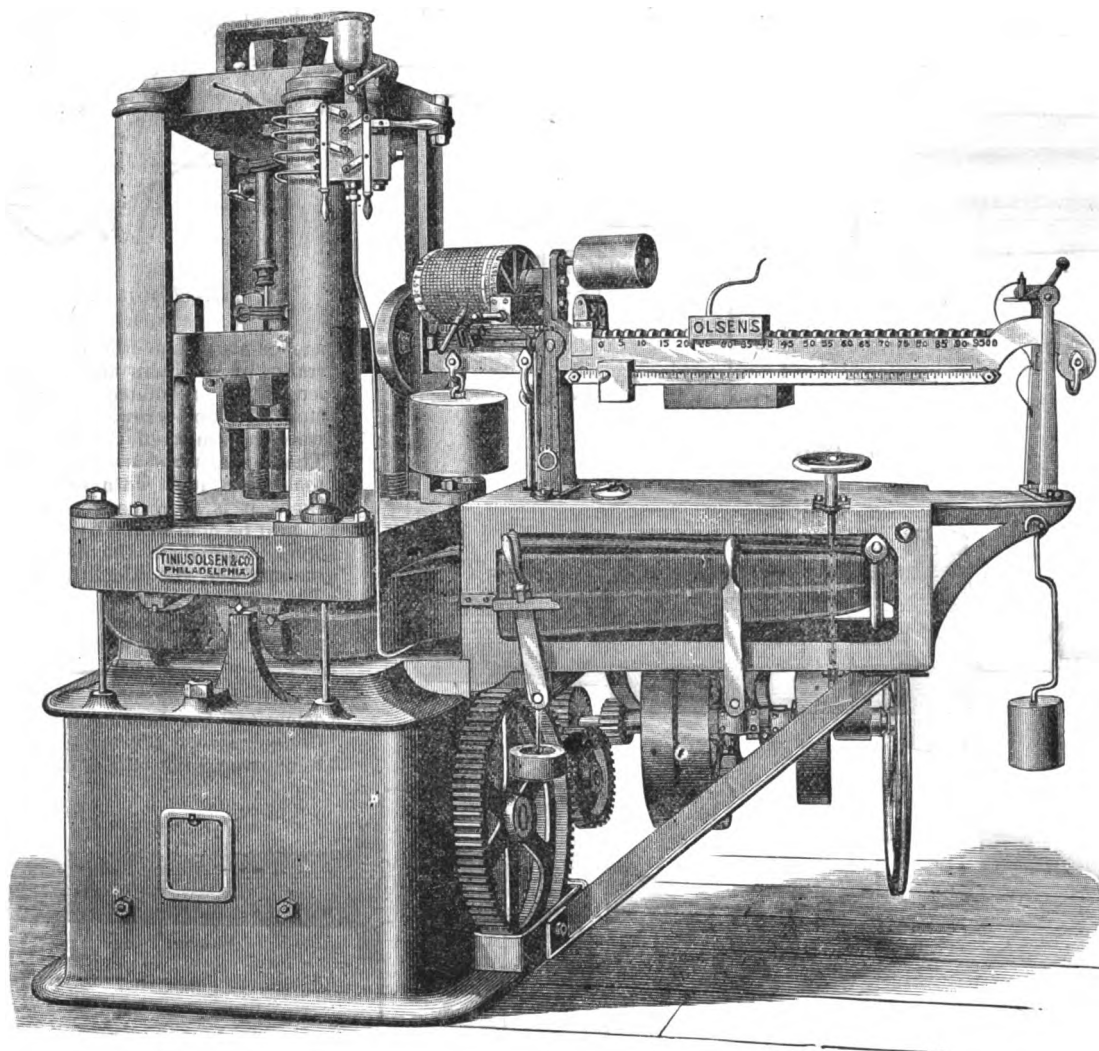
The illustrations represent the latest form of automatic testing-machines built by Tinius Olsen & Co., of Philadelphia, Pa. One end of the sample of material of which it is desired to ascertain the tensile strength is secured by proper tools to the extreme upper plate of the machine, while the other end is secured to the plate below, thereby exposing that part of the specimen between the plates on which the strain is exerted. The lower plate or cross-head is secured to four straining-screws which pass through holes at the carriers of the weighing platform of the machine, through openings in the levers and bed-plate, and enter the driving-nuts situated below the

portant on cast-iron and plate specimens of wrought-iron or steel.

The weighing apparatus consists of the main levers upon which the platform rests, three in number, and so constructed as to act as a single lever, and supporting the platform upon which rest the columns which carry the upper plate or cross-head. As one end of the specimen is secured in the upper cross-head any stress imparted to the specimen by the lower straining-head will be communicated through the columns and platform to the levers. The stress on the main lever is through an intermediate lever connected to the beam, where the amount is balanced and thus registered. The stresses are in this machine automatically balanced on the

after his calculations or measuring while the specimen is being pulled apart, thus saving much time. The wheel at the end of the screw besides operating the screw also serves as a dial vernier for reading the smaller fraction of the stresses.

The machine is also provided with means by which it graphically records the result of the test. In order to do this the distortion of the specimen under test must not only be observed but transferred to a piece of paper which is mounted on a drum on the beam, in front of which is seen the pencil for marking the diagram. The pencil is moved axially along the drum by the same screw that moves the poise on the beam, and thus this motion indicates the stress on the specimen. The



AUTOMATIC TESTING-MACHINE, MADE BY TINIUS OLSEN & CO.

latter. Feathers fitting into longitudinal slots cut through the threads of the screws prevent them from turning, and they therefore either rise or fall and carry the lower plate with them as the nuts are rotated. These nuts are operated through bevel gearing by outside spur gearing and counter-shaft, which is shown in the lower right of the cut. The counter-shaft is provided with double cone and friction pulleys, admitting of six downward or pulling speeds and two upward speeds.

For tensile tests the ends of the specimen are secured to the plates by steel wedges which enter rectangular openings cut through the centers of the plates. Interposed in the space between the wedges proper and the plate are spherical surface bearings by which the wedges are adjusted to the specimen, and the specimen is adjusted centrally and on a parallel line to the line of greatest stress, and a straight pull secured. This item is especially im-

portant on cast-iron and plate specimens of wrought-iron or steel. The weighing apparatus consists of the main levers upon which the platform rests, three in number, and so constructed as to act as a single lever, and supporting the platform upon which rest the columns which carry the upper plate or cross-head. As one end of the specimen is secured in the upper cross-head any stress imparted to the specimen by the lower straining-head will be communicated through the columns and platform to the levers. The stress on the main lever is through an intermediate lever connected to the beam, where the amount is balanced and thus registered. The stresses are in this machine automatically balanced on the

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rotary motion of the drum is reserved to show the distortion of the specimen. On the specimen are secured small heads a certain distance apart, say 6, 8 or 10 inches, the distance in which the distortion, or, in case of tensile tests, the elongation, is to be observed. Between the heads are placed small cylinders partly filled with water, a similar cylinder being placed on the beam in front of the drum. These cylinders are then connected through a collector and reservoir shown at the top of the illustration, and by the help of which the arrangement is controlled and operated. The drum carrying the paper can be connected directly with the cylinder in front of it, and when all is properly adjusted any expansion of the cylinders and their pistons on the specimen caused by its elongation will cause corresponding contraction of cylinder and piston in front of the drum, and this motion is transferred to the drum on which the line is drawn.

This line is drawn on properly-lined paper, so that the results of the test, tensile strength, limit of elasticity and elongation may be observed at a glance.

#### Verbatim Copy of Texas Trust Law.

We have received a copy of the act of the Texas Legislature which was adopted for the purpose of crushing out all trusts and combinations seeking to do business in that State. The act was approved by the Governor on March 30. It reads as follows:

[S. H. Ba. Nos. 9, 117, 136, 192 and 313.] An Act to define trusts, and to provide for penalties and punishment of corporations, persons, firms and associations of persons connected with them, and to promote free competition in the State of Texas.

Section 1. Be it enacted by the Legislature of the State of Texas: That a trust

or transportation at a fixed or graduated figure, or by which they shall in any manner establish or settle the price of any article or commodity or transportation between them or themselves and others to preclude a free and unrestricted competition among themselves or others in the sale or transportation of any such article or commodity, or by which they shall agree to pool, combine, or unite any interest they may have in connection with the sale or transportation of any such article or commodity that its price might in any manner be affected.

Sec. 2. That any corporation holding a charter under the laws of the State of Texas which shall violate any of the provisions of this act shall thereby forfeit its charter and franchise, and its corporate existence shall cease and determine.

Sec. 3. For a violation of any of the provisions of this act by any corporation mentioned herein it shall be the duty of

Sec. 6. Any violation of either or all the provisions of this act shall be and is hereby declared a conspiracy against trade, and any person who may be or may become engaged in any such conspiracy or take part therein, or aid or advise in its commission, or who shall, as principal, manager, director, agent, servant, or employee, or in any other capacity, knowingly carry out any of the stipulations, purposes, prices, rates, or orders thereunder or in pursuance thereof, shall be punished by fine not less than \$50 nor more than \$5000, and by imprisonment in the penitentiary not less than one nor more than ten years, or by either such fine or imprisonment. Each day during a violation of this provision shall constitute a separate offense.

Sec. 7. In any indictment for an offense named in this act it is sufficient to state the purposes or effects of the trust or combination, and that the accused was a member of, acted with or in pursuance of it, without giving its name or description, or how, when, or where it was created.

Sec. 8. In prosecutions under this act it shall be sufficient to prove that a trust or combination as defined herein exists, and that the defendant belonged to it or acted for or in connection with it, without proving all the members belonging to it, or proving or producing any article of agreement or any written instrument on which it may have been based, or that it was evidenced by any written instrument at all. The character of the trust or combination alleged may be established by proof of its general reputation as such.

Sec. 9. Persons out of the State may commit and be liable to indictment and conviction for committing any of the offenses enumerated in this act which do not in their commission necessarily require a personal presence in this State, the object being to reach and to punish all persons offending against its provisions whether within or without the State.

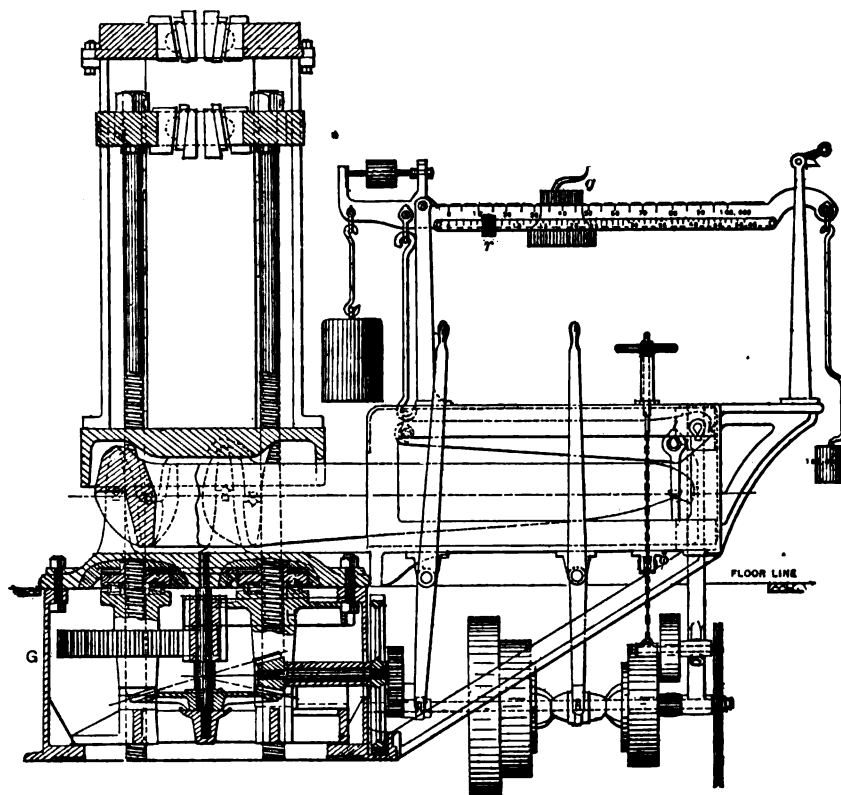
Sec. 10. Each and every person, corporation, or association of persons who shall in any manner violate any of the provisions of this act shall for each and every day that such violation shall be committed or continued forfeit and pay the sum of \$50, which may be recovered in the name of State in any county where the offense is committed or where either of the offenders reside, or in Travis County, and it shall be the duty of the Attorney-General or the District or County Attorney to prosecute for and recover the same.

Sec. 11. That any contract or agreement in violation of the provisions of this act shall be absolutely void and not enforceable either in law or equity.

Sec. 12. That the provisions hereof shall be held cumulative of each other and of all other laws in any way affecting them now in force in this State.

Sec. 13. The provisions of this act shall not apply to agricultural products or livestock while in the hands of the producer or raiser.

Sec. 14. Whereas the people of this State are without a remedy against trusts, therefore an emergency and imperative public necessity exists requiring that the constitutional rule which requires that all bills shall be read on three several days be suspended, and that this act take effect from and after its passage, and it is so enacted.



VERTICAL SECTION THROUGH AUTOMATIC TESTING-MACHINE.

is a combination of capital, skill, or acts by two or more persons, firms, corporations, or association of persons, or of either two or more of them for either, any, or all of the following purposes: First—To create or carry out restrictions in trade. Second—To limit or reduce the production, or increase or reduce the price of merchandise or commodities. Third—To prevent competition in manufacture, making, transportation, sale, or purchase of merchandise, produce, or commodities. Fourth—To fix at any standard or figure, whereby its price to the public shall be in any manner controlled or established, any article or commodity of merchandise, produce, or commerce intended for sale, use, or consumption in this State. Fifth—To make or enter into, or execute or carry out any contract, obligation, or agreement of any kind or description by which they shall bind or have bound themselves not to sell, dispose of, or transport any article or commodity, or article of trade, use, merchandise, commerce, or consumption below a common standard figure, or by which they shall agree in any manner to keep the price of such article, commodity,

the Attorney-General or District or County Attorney, or either of them, upon his own motion, and without leave or order of any court or judge, to institute suit or *quo warranto* proceedings in Travis County, at Austin, or at the county seat of any county in the State, where such corporation exists, does business, or may have a domicile, for the forfeiture of its charter rights and franchise, and the dissolution of its corporate existence.

Sec. 4. Every foreign corporation violating any of the provisions of this act is hereby denied the right and prohibited from doing any business within this State, and it shall be the duty of the Attorney-General to enforce this provision by injunction or other proper proceedings in the District Court of Travis County, in the name of the State of Texas.

Sec. 5. That the provision of Chapter 48, General Laws of this State, approved July 9, 1879, to prescribe the remedy and regulate the proceedings *quo warranto*, &c., shall, except in so far as they may conflict herewith, govern and control the proceedings when instituted to forfeit any charter under this act.

The new buildings for the New York Central Railroad, to replace those recently destroyed in the \$1,000,000 fire at the foot of Sixtieth street, in this city, will have many valuable improvements. An elevator of 1,500,000 bushels capacity that will cost \$400,000 will be built upon the old timber foundations. Piers B and D will be rebuilt, each with a two-story iron shed. A large storage warehouse, 200 feet square, will also be erected. The improvements will cost nearly \$1,000,000.

## THE AMERICAN ENGINEERS IN ENGLAND.

(Editorial Correspondence.)

After a delightful run from Queenstown to the Mersey the good ship City of Richmond reached Liverpool. With the tender came the Reception Committee of the Liverpool Engineering Society and representatives of the Council of the City. Their first graceful act of hospitality, after a brief address of welcome had been pronounced and responded to, was to present magnificent bouquets to the two leading ladies of the party. Embarking on the tender, three vigorous cheers were given to Capt. E. Barff, of the City of Richmond, a proceeding which Liverpool people pronounced unprecedented, but which it was subsequently learned was highly appreciated as a spontaneous and cordial acknowledgment of the efforts made to render the trip across the Atlantic comfortable. After the customary search for spirits and cigars at the customs, a glaringly perfunctory proceeding so far as the ladies' "luggage" was concerned, the rest of the day was spent in wondering why the floor was so solid, while the night was, according to the confession of the majority, largely employed in watching the antics of the four bed-posts and enjoying the luxury of freedom of movement. On the whole, the process of getting off one's sea-legs was less distressing than getting on them.

The engineers had arrived a day earlier than expected. English hospitality was, however, equal to the occasion, so that for Wednesday afternoon (the 5th) two impromptu excursions were planned. The morning was filled by your correspondent by a call on the Mayor, in company with Henry R. Towne. Special permission was granted to inspect the magnificent Town Hall and to attend a meeting of the Town Council. It happened that bills of the Finance Committee were up for debate. One young Radical made it a point to attack those of his fellow-councilors who had gone on little junketing trips to London, especially during Derby Day, and had pocketed allowances of 5 guineas a day each for the services thus rendered. Human nature appears to be very much the same in swaying the hayseed legislator or the English town councilor. Your correspondent was particularly interested in listening to the famous "hear, hear" (pronounced he-ah, he-ah) with which English parliamentary speeches are so liberally sprinkled as evidences of approval.

In the afternoon the majority of the party split up into two bodies, one being carried off to see the Liverpool end of the Manchester ship canal works, while the other, in which were included most of the ladies, proceeded to Knowsley, the seat of the Earl of Derby.

During the course of the day invitations to visit points in the vicinity of Liverpool began to pour in upon the committee. They were pressed with such hospitable persistency that their acceptance became a duty. The embarrassments of those who represented the organization of the guests were increased very seriously through the fact that the City of New York, among whose passengers were about 100 engineers and their ladies, had not yet been telegraphed. It was impossible under the circumstances to supply our hosts with any definite information concerning the number for whom they were to make preparations. Rival attractions, too, appeared to have an unsettling effect upon the minds of the engineers themselves, so that it was apparently impossible to state at any given moment who

and how many would accept invitations to any one point of interest. That this confusion should have failed to lead to any discomfort to the visiting engineers is entirely due to the Herculean efforts of the Liverpool local committee, whose chairman was Alfred Holt, the treasurer being George Heaton Dalish, and the secretary Henry R. West. Their efforts were seconded by C. H. Darbishire, president, and J. J. Potts, vice-president of the Liverpool Engineering Society. It is the pleasant privilege of a journalist to express in behalf of his associates, in a manner less formal than can be done in resolutions, a thorough appreciation of the overwhelming hospitality shown under circumstances peculiarly calculated to increase its burdens. It is often said that a characteristic of Americans is their constant habit of comparing their own aims and their own work with that of others, with the ultimate object of excelling. If such an idea lingered in the minds of many, with reference to the reception of the Iron and Steel Institute, and, it is hoped, other kindred societies in America in the fall of 1890, its realization must now appear far remote.

On Thursday, June 6, two alternate excursions were offered to the visitors, the first being over

### THE MERSEY DOCKS AND HARBOR ESTATE.

The party was driven from the hotels to the Hercules Dock, whose main feature is the range of 60 "casements," tunneled into the rock for warehousing petroleum in barrels. The front wall is Portland cement concrete; and it and the doors are so arranged that in case of fire they could contain in bulk all the oil in that particular department. The aggregate storage capacity is 60,000 barrels. Passing along the Harrington Dock, adjoining, the party reached the Toxteth Dock and then went by special omnibus to the Coburg Dock Pumping Station. The group of docks surrounding the pumping station, of about 50 acres in extent, was built many years since and therefore has not the depth of water required for modern vessels. As it cannot be obtained by structural alterations, the Coburg Pumping Station has been provided to raise the water in the docks to a minimum depth of 22 feet during all variations of high-water level. The pumping plant includes three Gwynne centrifugal pumps, whose fans are 7.5 feet in diameter with 54-inch suction and delivery pipes capable of discharging in the aggregate 800 tons of water per minute. They are driven by inverted compound condensing engines of 1500 indicated horse-power. At low neap-tides access is gained to the docks by way of the modern deep-water docks to the southward, locks being provided in the Union Dock. Thence the party proceeded to the Waterloo Dock grain warehouses, built about 20 years since after the ordinary system of "floor" warehouses, as it was necessary that they should be available either for grain or for ordinary goods. The aggregate area of the floors is about 12 acres, and they have an aggregate storage capacity of about 57,000 tons of grain. Five buckets, each capable of elevating 60 tons per hour, are situated in towers disposed around the dock. They elevate the grain to the top of the warehouse from receiving hoppers placed below the quay level. The grain is passed through hoppers to the weighing-machines, whence it falls into distributing hoppers. From there it is received on endless traveling belts which convey it to any part of the upper floor. From this floor the grain is delivered through shutters to any part of the building. Screening machinery and hydraulic lifts are also provided. All this machinery is worked by hydraulic power with an accumulator pressure of 700 pounds per square inch.

The party then proceeded to the Sandon Graving Docks, where pumps have been at work for some years for increasing the depth of water within the dock and over the graving dock sills on low neap-tides, so as to render the latter available at such times for vessels of deeper draft than would otherwise be possible. The pumping plant consists of five Gwynne invincible centrifugal pumps. Four of them have fans 60 inches in diameter and 36-inch suction-pipes. They are driven direct by four independent high-pressure engines. On trial it was found that the maximum combined discharge of the pumps was 513 tons per minute.

The Alexandra Dock and Langton Graving Docks, next visited, were completed in recent years specially for the accommodation of the large steamers employed in the Atlantic trade. The arrangement provides for an exceptionally large amount of quay and shed space in proportion to the total area of ground occupied. The graving docks are divided by gates in the center, so that in the event of one vessel requiring dry-dock accommodation for a long time it does not interfere with the use of the lower portion of the dock.

The visitors were then conducted to the steamer Lancashire, and while crossing the river were entertained on board at luncheon at the invitation of the Liverpool Reception Committee. The Birkenhead Docks were then entered and inspected. Afterward the party steamed up the river and returned to Liverpool. A neat compliment, highly appreciated by the visitors, was the dressing of all the ships in the harbor along the route, a courtesy which your correspondent was informed by friends is very unusual.

The second party started at the same time for

LAIRD BROS.' BIRKENHEAD IRON-WORKS, at Birkenhead, opposite Liverpool. The firm is an old one, having been founded in 1824 by William Laird, and since its establishment has built, including those now in hand, 576 vessels, having an aggregate tonnage of over 350,000 tons and an aggregate indicated horse-power of 304,000, a large proportion of the work having been done for the British Government. Special attention has been given to the design and construction of steamers for river navigation, some of which have been pioneers in opening up rivers which are now important channels of commerce. Among them was the John Randolph, which, it is claimed, was the first iron steamer ever seen on American waters.

Passing through the model-room the party entered the old armor-plate shop, at present used for general work, and reached the frame-bending shop and furnace building. Near them were the slips for building two very fast torpedo gun-boats of an improved Rattlesnake type. Their dimensions are 230 x 27.5 x 14.75 feet. They have 4500 horse-power engines, and are designed for a speed of 21 knots per hour. Here, also, the Gazelle, for the Great Western Railway Company, was building. Next followed No. 5 Graving Dock, where the Argentine battle-ship Almirante Brown was being prepared for overhaul and refitting. Next was No. 4 Graving Dock, in which two twin-screw steamers, Lynx and Antelope, were being completed. They are for the Great Western Railway Company. Each is 285 feet long, 27.5 feet beam and draws 13 feet 2 inches. Their engines are 1600 horse-power, and their speed is estimated at 16 knots. In the engine-shops the machinery for the Antelope and Gazelle and the 3300 horse-power engines for the Russia were in course of construction. Near No. 4 Graving Dock is a 50-ton crane for masting and boiling vessels, and near it the Russia, a 373-foot steamer for the Hamburg and American Steam Packet Com-



pany, was building. No. 3 Graving Dock, in which the man-of-war Agincourt and other large vessels were built, is permanently covered over, having overhead power-driven traveling cranes, which traverse in two directions. After seeing the smith's shop, Nos. 1 and 2 Graving Docks, sawmills, joiners' shops and mold lofts, the party was driven to the new boiler-works of the firm, which were completed in September last. They have already turned out boilers of about 30,000 horse-power, many of them of an exceptional size, two of the largest having weighed about 95 tons each. The ground covered by buildings is nearly 6000 square yards, the factory consisting of four principal spans parallel to one another. The largest of these is reserved for the erecting work, being 286 feet long, 58 feet wide and 58 feet high. An annex is the shop for receiving and preparing the material ready for erecting. Another annex is devoted to lighter work, and a third is used as the smith-shop. At the quay adjoining the boiler-works the Hamburg and American Steam Packet Company's steamer Columbia is now nearing completion. Her dimensions are 463 x 56 x 36.8. She is propelled by twin screws, with triple-expansion engines of 12,500 indicated horse-power, supplied with steam at 150 pounds pressure from nine cylindrical boilers.

From the Columbia the party was driven through Claughton and the Birkenhead Park to the Town Hall, where they were received by the Mayor and were shown through the building. They then proceeded to the residence of William Laird, where they were hospitably entertained, and after luncheon and speech-making were photographed in a group. The next visit on the programme was to

#### THE MERSEY TUNNEL RAILWAY,

which connects Liverpool with Birkenhead and the Wirral Peninsula of Cheshire, the width of the Mersey at that point being 1320 yards. The road is constructed almost entirely in tunnel, of double-line width, and is lined throughout with brick in cement. Under the river the tunnel is in sand-stone rock, with an average cover of 30 to 35 feet, the lowest rail-level being 145 feet below mean-level water mark. The gradients are therefore somewhat severe for English practice, being on the Liverpool side 1 in 27. The drainage of the tunnel is dealt with by two pumping-shafts, one on each side of the Mersey, the water draining to the shafts through drainage headings beneath the tunnel. On each side of the river there are three pumping-engines of 200 horse-power, of the compound walking-beam and compound horizontal type. The steam-cylinders are 36 and 55 inches in diameter, the pump-rams being 40 inches in diameter by 15-foot stroke. The tunnel is ventilated by four 40-foot Guibal fans 12 feet wide, driven by 120-horse-power compound condensing engines running at 45 revolutions. They exhaust about 200,000 cubic feet of air per minute from a gallery 7 feet 2 inches in diameter, running parallel with the tunnel, into which there are frequent openings, with sliding doors, so that the exhausting action of the fans can be distributed or concentrated at pleasure. On each side of the Mersey are hydraulic lifts, or elevators, for raising passengers from the under-ground station platforms to the street level 100 feet above. The elevator rams are 18-inch steel tubes in 12-foot lengths, secured together. The pressure is 90 to 100 pounds per square inch, being supplied from tanks placed in lofty water-towers, which form striking architectural features of the river-side stations. These tanks are kept full by small pumping-engines. The cars accommodate 100 passengers at a time.

In the evening the American engineers

were entertained in a sumptuous manner at a reception in the beautiful Town Hall by E. H. Cookson, Mayor of Liverpool, a very large number of the leading citizens being invited to meet them. The affair was exceedingly brilliant, the series of wonderful reception-rooms of the Town Hall being thronged.

#### TOUR THROUGH NORTH WALES.

One of the parties started on the 7th, under the auspices of the London and Northwestern Railway, on a tour through North Wales, visiting first the ancient city of Chester, famous for its Roman wall, castle, cathedral and rows, and driving to Eaton Hall, the seat of the Duke of Westminster, reaching Llandudno, the greatest of Welsh watering-places, in the evening. Favored by glorious weather, a drive was taken around the Great Orme's Head in the morning. In the afternoon a visit was paid to Conway Castle, built in 1284 by Edward I; Bettwys-y-Coed, a charming spot, being reached in the evening. There Sunday was spent quietly. Monday again found the party on its travels, Blaenau-Ffestiniog, with its great slate quarries and its quaint railway, being visited in the morning. From Port Madoc coaches conveyed the engineers through Tremadoc, Aberglaslyn, Beddgelert and through the pass to Llanberis. Tuesday morning, June 11, was spent in a visit to the Llanberis lake and fall and the ruins of Dolbadarn Castle, a short run by rail then taking the tourists first to Carnarvon, with its ruins, and to Menai Bridge. Wednesday morning was given over to a drive to Anglesea to visit the Suspension Bridge and Stephenson's famous Britannia Tubular Bridge. In the afternoon the party left for Bangor, passing through Llanfairfechan, Penmaenmawr, Conway and Colwyn Bay. Crewe is to be reached in the evening, and at 10 o'clock at night the party expects to roll into Euston Station, in the great metropolis.

A second party started from Liverpool to Crewe on Friday morning (7th) to visit THE CREWE SHOPS OF THE LONDON AND NORTHWESTERN RAILWAY,

where they were received by F. W. Webb, the well-known mechanical engineer, who has during the past few years done so much to develop the compound locomotive. The party were received at the offices of the company by a band playing national airs, while one of the latest of Mr. Webb's engines moved along the track before the assembled engineers. Side-tracked near by was a long array of the different types of engines built at the Crewe shops. Our hosts at once conducted the visitors into the great drawing-office, where an elaborate lunch was provided. Speeches followed, J. P. Bickersteth, vice-chairman of the London and Northwestern Railway Company, being in the chair. In responding to a toast by W. H. Wiley, Mr. Webb gave some data relating to the company of whose service he is so distinguished a member. The railroad has a capital of \$528,000,000, its annual gross revenue being \$51,500,000 and its annual expenditure \$26,500,000. It operates 2500 miles of road and carries 57,000,000 passengers, whose tickets call for the consumption of 50 tons of paper. Its tonnage of freight is 36,000,000 tons annually, the engine mileage last year having been 55,525,384. Last month, with a mileage of 4,750,000, only one engine in the passenger service was slightly out of order, so that Mr. Webb undertook to say that he could, barring accidents due to the permanent way, go twice around the world with one of his engines without making the slightest repairs. During the last year, besides the ordinary service, the road ran 41,314 special passenger trains, 47,223 special freight trains and 78,285 special cattle and mineral trains. The company own 53,000

freight-cars, 5600 passenger-cars, 2500 engines and 20 steamships. The Crewe locomotive works are a part of the manufacturing establishment of the railroad company. They occupy 116 acres of ground, the covered area being 36 acres. The plant consists of four 5-ton Bessemer converters, in groups of two, placed opposite one another on either side of the deep pit. Following it, in the same line are the open-hearth furnaces, one of them, a 20-ton furnace, being just completed. The rail department contains a rather old-fashioned three-high rail-train, driven by a fine horizontal engine with Corliss gear. The route then lay through the points and crossing department into the boiler-shop, where, among other matters of interest, the new Webb corrugated boiler was inspected. To the majority of the engineers the most interesting sight was the flanging-presses, one being a 75-ton press for flanging boiler-fronts, and the second, over 200-ton, for punching out and simultaneously flanging the fire-door. The works have a very large plate mill, and they also roll angles and shapes. They are fitted with 8-ton, 30-ton and 10-ton hammers, and have a tire mill, steel foundry and iron forge. Thence the visitors went to the signal-shop and paint-shop, after which they returned to the train and were conveyed to the millwright's, joiner's shops, the sawmills and through the smithy into the locomotive-erecting, wheel and fitting shops. In the meantime the ladies had been entertained at tea at the fine residence of Mr. Webb.

The majority started by special train to Manchester, where they were joined by another body, who in the interval had paid a visit to the

#### HORWICH SHOPS OF THE LANCASHIRE AND YORKSHIRE RAILWAY.

These works are of particular interest, since they embody the latest practice in English engineering work. Starting with a clean sheet of paper, the entire disposition of the plant could be made with special reference to requirements, building having begun in 1886. They were erected for the purpose of repairing and renewing the whole of the locomotive stock and carrying out the mechanical engineering work of the Lancashire and Yorkshire Railway Company. The land inclosed includes 85 acres, located between the Chorley New Road and Horwich and Red Moss, the covered area of the work-shops being 13½ acres. The first point of interest aside from the offices, laboratory, test-room (with a 100-ton machine) and general stores is the boiler-shop, 364 x 111 feet. It is fitted with a pair of hydraulic pumps and accumulator, two large fixed hydraulic riveters for boiler work, each having a hydraulic overhead crane for lifting boilers when riveting, three portable hydraulic riveters on swing cranes bolted to walls and columns and three overhead traveling cranes.

The smith's shop is provided with 12 double and 31 single hearths, a reheating furnace, bolt and nut making plant, hammers, &c. The forge, 362 x 111 feet, has a 14-inch merchant mill and an 8½-inch guide mill, with Siemens regenerative furnaces for reheating. The steel-works are equipped with two open-hearth furnaces, having a high level tramway for carrying the ladle and a narrow-gauge track, which connects with the forge and rolling-mill, for the mold trollers. The whole of the furnaces in the steel-works and the rolling-mill are heated by gas, made from a series of Wilson gas-producers. Then follows the foundry, 212 x 111, equipped with two cupolas, supplied with blast by a Root blower. Hydraulic power is used for working the cranes, in addition to which there are two overhead rope power traveling cranes. A second foundry, 62 x 128, with two cupo-

las, is used for casting the chairs used for the permanent way. A staging is provided for "fettling" the chairs, which are then placed on an endless chain, which conveys them to the railway cars for shipment. Special large shops are provided also for a brass foundry, tinsmith's and copper-smith's shop, for testing, repairing and renewing the electrical instruments used, for wood-working, and for the manufacture of signals, springs, points and crossings. The fitting-shop, 400 x 111 feet, is provided with a large number of special tools for dealing with locomotive work, including a large milling tool for cutting out crank-axle webs, crank-axle lathes, milling, planing and slotting machines. These are driven by two wall engines, placed at the end of the shop, giving motion by means of bevel gearing to four ranges of shafting, running longitudinally, and to four 5-ton high-speed rope-jib traveling cranes, which control the principal heavy machines. By far the showiest of the buildings is, however, the erecting-shop, which is not less than 1520 x 118 feet. It has been arranged for the repairs of existing and the building of new engines and tenders. It is supplied with 20 30-ton overhead power-cranes, driven by wall engines. Their handling great engines in so large a building was an impressive sight. A chain shop, 110 x 27, and a chain smithy, 64 x 28 feet, are provided with a large hydraulic testing-machine for testing all chains before they are sent out for use. The company have their own gas-works, and have built for the convenience of their employees a dining-room, to accommodate 1000 men, and a *café* and reading-rooms.

The party was hospitably entertained at luncheon by the company, its chief engineer, J. A. F. Aspinall, acting as host. A series of speeches followed the usual toasts to the Queen, the royal family and the President of the United States, which apparently are a feature of all such gatherings. The party was then conveyed by special train to Manchester.

Reaching Manchester in the afternoon, the party visited Owens College, the Lancashire and Yorkshire Company's car-works, at Newton Heath, the Salford Corporation sewage works, and a number of other establishments thrown open to them. In the evening they were joined by the party from Crewe, and after a reception by the Mayor of Manchester sat down to a most elaborate banquet as the guests of the Manchester Engineers' Reception Committee, of which William Bradford was the president and Thomas Ashway the secretary. Leaving Manchester, after having spent the morning visiting the Manchester Ship Canal Works and a number of engineering and manufacturing establishments, the members of this division rode to Chester, where Sunday was spent. Monday brought them to Rugby, Leamington and Warwick, whose famous castle they visited. Tuesday morning they reached Stratford-on-Avon, and driving thence to Kenilworth a visit was paid to the castle, Oxford being reached in the evening. Wednesday was to be spent visiting the colleges, London being reached in the evening.

#### FUTURE MOVEMENTS OF THE ENGINEERS.

The tours through some of the most picturesque parts of England were arranged in order to pass the Whitsuntide holidays. To judge from the programme settled upon by the London engineers, the serious business of sight-seeing is then to begin. On Thursday, June 13, there will be a special choral service at Westminster Abbey, followed by an address by the Dean, Dr. Bradley, on the sacred and historical associations of the Abbey. At noon the Houses of Parliament are to be visited. In the afternoon there is to be a formal reception at the Institution of

Civil Engineers, followed later by the presentation of an address by the president, Sir John Coode, K.C.M.G. In the evening there will be a dinner at Guild Hall "by the express sanction of the Lord Mayor, Aldermen and Court of Common Council of the City of London."

Friday two parties are arranged to go down the Thames to visit docks, drainage and sewerage works, ship-building and torpedo yards, the afternoon being given to a visit to Lambeth Palace and the Doulton Potteries and art studios.

Saturday one party goes to Windsor to be entertained at the Albert Memorial Hall, to be followed by a drive through Windsor Great Park to Virginia Water. Another group is given an opportunity to attend a performance of the "Midsummer Night's Dream" at Copped Hall, Totteridge. In the evening a reception will be given by Lord Brassey. Monday St. James' Palace, Buckingham Palace and the Royal Mews will be visited, the evening being reserved for a garden party at Holly Lodge, Highgate, by the invitation of the Baroness Burdett-Coutts and Mr. Burdett-Coutts, M.P.

Tuesday, June 18 and 19, and Wednesday are given over to visits to works, to Hampton Court Palace and the Royal Botanic Society's Flower Show in the Regent's Park. Thursday a special train and boat will take the engineers to Paris.

The German engineers have evidently been seized by the same eager desire to entertain their American brethren. At a meeting of the Verein Deutscher Eisenhüttenleute and other organizations at Dusseldorf it was resolved to extend a cordial invitation to them. Herr Schroeder, the secretary of the society, traveled specially to Liverpool as its bearer, and it is possible that at least a small number of American engineers will avail themselves of an exceptional opportunity to visit the centers of industry of Westphalia and the Rhine provinces. It is now intimated that the iron masters of Lorraine are organizing to capture some of the Americans as their guests.

#### Open-Hearth Furnace with Detached Melting-Chamber.

The accompanying illustrations, furnished by L. G. Laureau, of Philadelphia, show a modification of the Siemens furnace, embodying features which, after a trial of several years' duration, have proved

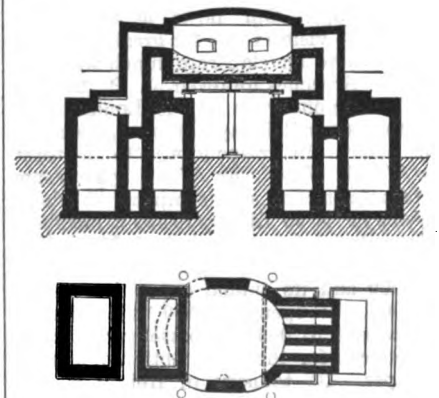


Fig. 1.

worthy of consideration. The furnace belongs to the type, now rapidly becoming common, where the melting-chamber is completely detached from the regenerators and the gas and air ducts. The melting-chamber is oval instead of round (as in some furnaces of the same type), so as to give a greater travel to the flame from port to port, thus allowing it to spend its energy in the furnace itself and

reducing its cutting action on the outgoing ports. The gas and air ports are made to open into the melting-chamber, side by side. This arrangement causes the flame to spread well across the entire furnace from front to back, melting as fast at the doors as in the center. It

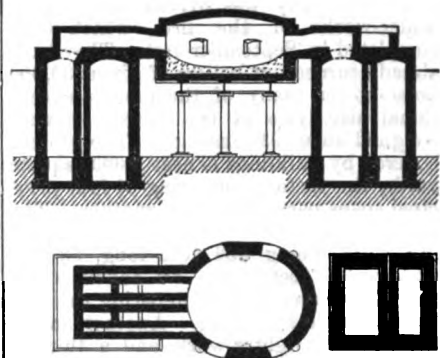


Fig. 2.

allows a long line of contact between the air and gas and furthermore makes the ports easily accessible for repairs. The cover bricks to the horizontal gas and air ducts outside of the furnace can be readily removed and the ports can be repaired rapidly from the outside without cooling

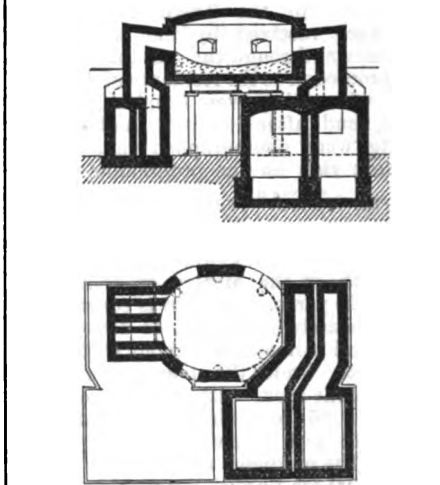


Fig. 3.

the entire furnace and regenerators. The roof is held in a wrought-iron band and rests upon the melting-chamber walls without being bound into them. It is made high so as to allow free play for the radiating effects of the flames. In furnaces of not over 12 tons capacity five ports (two large air and three small gas) have proved ample and efficient. In furnaces of 15 tons capacity and over seven ports should be used.

The three cuts illustrate how this type of furnace can be modified according to circumstances. Fig. 1 shows the normal furnace; Fig. 2 a furnace suited to a location where water is found close to the general level; while Fig. 3 shows the same furnace where space lengthwise of the structure is limited. The same arrangement of parts has been used in heating furnaces with marked success.

The area of the Territories of North and South Dakota, Montana and Washington is equal to the combined area of the German Empire, Great Britain and Ireland, the Netherlands and Switzerland, the former being 361,588 square miles and the latter 361,500 square miles. The European area contains a population of over 90,000,000; the American area has a present population of less than 1,000,000.

## THE WEEK.

An 8-inch pipe line from the Ohio oil fields to Detroit will be completed by September 1.

The Interstate Commerce Commission have issued a new and revised edition of the rules of practice before that body, adding several new ones that have been found necessary by experience, and containing also concise and complete forms for complaints and other proceedings before the commission. Care has been taken to make these rules as simple as possible, to enable business men, if they desire, to prepare their papers themselves. The commission desire to have the rules distributed, and copies may be procured without charge upon application to the secretary.

New York City is able to boast of having within its boundaries 294 individuals or firms each good for \$1,000,000 or upward.

An eight-story brick building, fire-proof throughout, is soon to be erected for the New Jersey Central Railroad Company on the corner of Liberty and West streets. The ground dimensions will be 200 feet on Liberty street and 100 feet each on West and Washington streets. The intention is to lease a considerable portion of the building to firms in the coal trade. The architects are Peabody & Stearns and the cost of the structure will not be less than \$500,000. The building will be finished May 1, 1890.

The Castle Garden Emigration Commissioners urge upon Secretary Windom the necessity of making their position a Federal office.

A maritime exhibition of a novel character is to be given in Madison Square Garden this coming fall, under the direction of C. S. Hill, secretary of the American Shipping and Industrial League. It is proposed to bring together samples of the products of 200 distinct industries which are either directly or remotely connected with the shipping interests of the country, and to contrast American machinery, models of vessels and appliances of various kinds with those of foreign origin. Machinery Hall will be devoted to machinery in motion. The peculiar feature will be a canal 25 feet wide and one-eighth of a mile long, to be navigated by steam launches and craft of various descriptions, and a central stage will serve as an arena for naval maneuvers.

The Minneapolis industrial exhibition opens August 21 for one month.

Two lads of a mechanical turn of mind were experimenting in Philadelphia on Saturday with an old kitchen boiler, pieces of gas-pipe and a miniature steam-engine almost 18 inches in length, which they proposed to connect with an ice-cream freezer. From some cause unknown the boiler burst, killing them both.

Howard, who was so successful in buying machinery for the bogus electric sugar process, was rewarded for his enterprise with a sentence of nearly nine years in the New York State prison.

The new city of Guthrie, in Oklahoma, was struck by a cyclone on the 20th inst., and scores of houses, of which there are several hundred in course of erection, were thrown down.

The manual-training school of St. Louis, which has a membership roll numbering 241, had its annual exhibition last week, and 40 graduates received their diplomas. The class forging iron and steel, 24 in number, attracted much general interest. Professor Woodward stated that the applications for membership were far in excess of the present capacity of the school, and he predicted that ten years hence would witness a greater number of manual-training schools in this country than was dreamed of in the philosophy of those who were to-day encouraging the belief that the idea and theory of such institutions were not in keeping with successful mental strength and development.

The new Hamburg line of steamships to Philadelphia will receive no outward cargo from that port, but load in Baltimore for the homeward trip. Philadelphia merchants protest against the so-called "boycott," but without success. The steamship and railroad companies are too closely allied.

Under the new law of Pennsylvania, already in force, children under 12 years of age cannot be employed in manufacturing establishments, and over that age and under 16 their employment is limited to six hours a day.

Montreal papers complain that Canada is "knocked out" of the export business in wheat and corn by the competition of American ports.

The Jay Gould stockholders still control the Pacific Mail Steamship Company.

The announcement is made that the last spike has been driven in the Georgia Pacific Railway. This is a leased line of the Richmond and Danville, and has been extended to a connection with the Missouri Pacific and the Mississippi River, in furtherance of the plan agreed upon when George Gould was made a director in the Richmond Terminal Company, who own the Richmond and Danville. This makes another through trunk line by which the traffic from the Southwest can be carried to the Atlantic sea-board.

A Shanghai dispatch says Li Hung Chang has accepted the control of railways in the north of China, and that tenders will soon be invited for the construction of a railway from Peking to Hankow, indicating the final triumph in that country of the progressive element as against the ultra-conservative.

The new Brooklyn city directory contains 195,220 names, a gain of 6254 over last year. The entire population is estimated at 880,000 to 900,000.

The Third Avenue Railroad Company, New York, having obtained authority from the Legislature to substitute cable-power for horses, and two-thirds of the property owners on the route having already given their consent, it is probable that the final step preparatory to making the change will be taken by asking the sanction of the Railroad Commission.

The New York Commissioner of Public Works, Mr. Gilroy, has recommended to the Board of Estimate and Apportionment the kind of pavement that should be laid down in the principal streets in this city, in accordance with the purposes of a special act of the Legislature authorizing the expenditure of \$3,000,000 during the next three years for street improvement. "From the experience of the past 15 years with pavements laid during that time," the Commissioner says, "it is found that the most suitable and durable pavement for the streets of the first class, the great avenues of trade and commerce, is a pavement of granite blocks, according to specifications now in use, with tarred joints and concrete foundation. No other pavement is known which will present equal resistance to the heavy wagon traffic in those streets and at the same time retain an even surface and give equally good foot-hold to horses. The tarring of the joints is useful in preventing the percolation of water through the pavement into the soil, which frequently causes settlement of the soil under the pavement

and corresponding depressions on the surface. For streets of the second class the stone blocks may be laid on the ordinary sand foundation or bed. In the purely residential streets a good asphalt pavement, laid on substantial foundation, is the more suitable. It should not be laid, however, where the grade is steep, because in such cases it would not afford a safe foot-hold to horses."

The opening of the Tennessee River to Chattanooga next September, into the heart of the mineral region in the South, will have an important effect on transportation rates throughout that section of country. Steamboats will be able to reach Chattanooga from New Orleans, Pittsburgh or the head of navigation on the Mississippi. A prominent railway-traffic manager says that boats at Chattanooga, otherwise returning empty, can carry pig-iron at a very low rate; they can carry it with profit to St. Louis for \$1.25 a ton, whereas the present rate is \$2.25 per ton to Cincinnati and \$3 to St. Louis. The opening of the Tennessee River, it is affirmed, will give the pig-iron producers on or near it an increased profit of \$1.75 per ton and enable them to compete with Pennsylvania pig to even better advantage in the Western markets.

The foundation walls are being laid in Duluth of the Chamber of Commerce building, to cost \$250,000.

The Wood-Acid Trust organized in Binghamton, N. Y., last April are complacent in the fact that the price of crude wood alcohol has advanced from 47 to 57 cents a gallon, or over 20 per cent., and there is a liberal advance also in the prices of the accompanying products of the factories—acetate of lime and naphtha. Wood alcohol offers itself as a cheap substitute for grain and fruit alcohols in mechanics, manufactures and the arts, and it is upon these branches of industry that the burden of the heavy increase of prices chiefly falls.

The old copper mine near Bristol, Conn., has been opened and is being worked by a large force of men with improved machinery and implements for mining. The managers of the new company are confident of fair returns.

The ten thousandth locomotive built at the Baldwin Locomotive Works, Philadelphia, was shipped from that establishment last week to the Northern Pacific Railroad for service on the mountain division of that road. This engine is remarkable, not only in bearing so high a consecutive number among engines turned out from a single establishment, but in marking a distinct advance in the progress of locomotive construction, which, among other causes, has made the cost of rail transportation in the United States less than in any other country in the world. It has a weight one-fourth greater than the largest freight locomotives of the Pennsylvania Railroad, and can haul, it is said, on a grade of 116 feet per mile, combined with reversed curves of 10°, a train weighing 535 tons, of 2240 pounds, of cars and load, or 20 loaded cars. On easier grades, of say 52½ feet per mile, or 1 foot per 100, its power is estimated at 1000 tons, exclusive of its own weight. Its actual weight in working order, exclusive of tender, is 150,000 pounds; cylinders, 22 x 27 inches; driving-wheels, four pair coupled, 50 inches. The Baldwin Locomotive Works were established in 1833, and 28 years, or until 1861, were required for the completion of the first thousand locomotives. But nine years, or until 1870, were required for the second thousand. The third thousand was completed in 1872, the fourth in 1876 during the Centennial, and the fifth in 1880. Five thousand more were constructed during the nine years since.

## MANUFACTURING.

### Iron and Steel.

The two new furnaces, &c., of the Nashville Iron, Steel and Charcoal Company, at West Nashville, Tenn., are to be sold on July 2. The sale is made necessary from lack of capital, the original subscribers failing to pay subscriptions to stock.

The laboratory at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., was destroyed by fire last week, causing a loss of about \$2000.

We are advised that the report that the Emma Furnace, of the Union Rolling Mill Company, of Cleveland, Ohio, had been sold to the Cleveland Rolling Mill Company is without foundation. The furnace named was blown in recently and is producing about 140 tons of Bessemer pig-iron per day.

One of the Himrod furnaces of the Brier Hill Iron and Coal Company, at Youngstown, Ohio, is out of blast at present, undergoing repairs.

Notice has been posted by the Glasgow Iron Company, of Pottstown, Pa., of an advance of puddlers' wages from \$3 to \$3.25 per ton. This will go into effect on and after the 1st of July, and will affect all the men in the puddling department of the iron-works.

The Pennsylvania Construction Company, of Pittsburgh, have been awarded the contract for the iron roof for the post-office building, now in course of erection in that city. The contract price for the work is \$50,740.

A number of the molders in the employ of the Pittsburgh Steel Casting Company, at Pittsburgh, went out on a strike last week on account of a disagreement in regard to wages. The trouble was afterward settled and the works are now in full operation.

At Pittsburgh last week Frank S. Layng filed a bill in equity against the A. French Spring Company, Limited. The capital stock of the company is \$500,000, of which Mr. Layng claims that he owns \$31,250. He states that in 1888 Aaron French, chairman of the spring company, without the knowledge or consent of the plaintiff or the Board of Managers of the company, purchased stock of the Bolton Steel Company, of Canton, Ohio, to the amount of \$87,500, a controlling interest. In payment, Mr. French gave three notes for \$25,000 each and the balance in cash. The purchase was professed to have been made on behalf of the spring company and was charged up to them. The Board of Managers afterward ratified the purchase. As a result, the regular dividends of the spring company have been suspended. Mr. Layng desires the court to enjoin the payment of the three notes out of the partnership funds, and that the Board of Managers be required to indemnify the company for any loss by reason of the purchase; also that the court decree that the purchase of the Bolton Steel Company's stock was not within the scope of the business of the partnership, and the purchasers be declared to have made the purchase on their own account.

The National Tube Works Company, of McKeesport, Pa., have recently purchased a large hotel building at that place, and will convert it into an immense sample-room for displaying all sizes and grades of pipe.

The rolling-mill of the Wheatland Iron Company, at Wheatland, Mercer County, Pa., which has been idle for some years, has been put in operation under the management of Henry Friend, of Pittsburgh. John Tomlins, formerly with Cartwright,

McCurdy & Co., of Youngstown, will have charge of the rolls. They will roll iron for 6-inch pipe, 32 inches wide and  $\frac{1}{4}$  inch thick.

Ella Furnace, at West Middlesex, Pa., operated under lease by the Wheeler Furnace Company, of Sharon, Pa., is out of blast at present, undergoing repairs. As soon as these are completed it will be put in operation again, as the firm have some large orders on hand for pig-iron.

From the Norristown, Pa., *Register* of the 19th inst. we take the following: "The work of rebuilding the McHose Furnace began this morning. The *débris* caused by the furnace being chilled some time ago has been cleaned out. The work of rebuilding was delayed a few days pending the arrival of a large iron cylinder which will encircle the bottom of the furnace, the idea being to render it less liable to chill. The device is a new feature to furnaces in this part of the State."

Two of the blast-furnaces of the Cambria Iron Works, at Johnstown, Pa., are in blast, and the other furnaces, the Bessemer Steel Works and the mill department will soon be running. The plant of the Gautier Steel Works was totally destroyed, but will be rebuilt and put in operation as soon as possible.

The Lehigh Valley Railroad Company have made a reduction of from 4 to 7 cents per ton in the freight on furnace coal to the blast-furnaces along their line, which places these establishments, so far as the coal supply is concerned, on about the same basis as the furnaces along the Philadelphia and Reading Railroad.

A San Francisco telegram, dated June 19, states that H. W. Hammond, representing an English syndicate, has selected a site at Vallejo, directly opposite the Mare Island Navy Yard, for extensive iron and steel works, and that \$10,000,000 has been subscribed for the purpose by English capitalists.

The Secretary of State of Illinois has issued a license to the East Chicago Tin-Plate Company, at Chicago, to manufacture iron, steel, tin-plate and all products of steel and iron; capital, \$250,000; incorporators, Edward L. Lamb, Zenas Bruno, William H. Smith.

The Paige Tube Company have been organized at Warren, Ohio, to succeed the Warren Tube Company, of that place. The new concern is composed of D. R. Paige, Albert Paige and O. C. Barber, of Akron, Ohio, and several other gentlemen. Arrangements are now being made to put the works in operation and it is expected they will be operated full time in the future. T. S. Bray, formerly manager of the tube department of the Riverside Iron Works, at Wheeling, W. Va., has been secured as superintendent.

McClure & Schuler, engineers and contractors, of Pittsburgh, have just closed a contract with the Riverside Iron Works, of Wheeling, W. Va., for the erection of a new blast-furnace in place of the one they now have at that place. It will be fitted up with three Massick & Crooke's hot-blast fire-brick stoves, of which McClure & Schuler have the exclusive control in this country. In October of last year there were but three of these stoves in operation in this country, those erected by Shoenberger, Speer & Co. at their No. 2 Furnace, at Pittsburgh, Pa. Since that time the following list of stoves have been put in operation: Three for the Williamson Iron Company, at Birmingham, Ala., 16 feet 6 inches x 62 feet; three for the North Chicago Rolling Mill Company, at Bay View, Wis., 18 x 65 feet; three for the Brier Hill Iron and Coal Company, at Youngstown, Ohio, 16 feet 6 inches x 62 feet; three for the Thomas Iron Company,

at Niles, Ohio, 16 feet 6 inches x 62 feet. In addition to the above the following list of stoves are in course of erection and will soon be completed: Three for Shoenberger, Speer & Co., at Pittsburgh, 16 feet 6 inches x 62 feet; two for the Paducah Iron Company, at Paducah, Ky., 16 feet 6 inches x 62 feet; three for the Bellaire Nail Works, at Bellaire, Ohio, 18 x 65 feet; three for the Brier Hill Iron and Coal Company, at Youngstown, Ohio, 19 feet 6 inches x 70 feet; one for the Chicago Furnace Company, at Chicago, 20 x 60 feet, to supplement their present fire-brick stoves, and four for the Carrie Furnace Company, of Pittsburgh, 19 feet 6 inches x 70 feet. The last named are about completed and the new furnace will be blown in not later than July 15. From the rapid manner in which these stoves have been adopted it is evident that they have given satisfaction wherever introduced.

We are informed that the report that Jones & Laughlins, Limited, proprietors of the American Iron and Steel Works, at Pittsburgh, had signed the Amalgamated scale for the coming year is without foundation. Up to Monday, the 24th inst., the scale had not been presented to the firm, and for that reason they were unable to say whether they would sign it or not when presented.

The Oxanna Nail Factory, at Oxanna, Ala., has begun the manufacture of cut nails.

Furnace No. 1 will blow in at Talladega Ala., the last part of July, and the city will have a great celebration.

The American Association, Limited, whose general offices are at Knoxville, Ky., inform us, under date of the 18th inst., that the statement going the rounds of the papers as to the contract made with that company by a Northern syndicate for the erection of iron and steel works in Middlesborough, Ky., is in the main correct. But, pending certain negotiations now current in England between the association's board of directors and the representative of the syndicate, they are not at liberty to publish details. The matter now in negotiation is a question of royalty and area.

### Machinery.

The Columbus Machine Company, of Columbus, Ohio, are at work on an order for three blowing-engines on order of James Leffel & Co., Springfield, Ohio, for the use of the Bookwalter Iron and Steel Company in the new Bookwalter process of steel-making. The engines are of 40-inch diameter and 2-foot stroke. An order is also booked for a similar engine of still larger size.

The large works of the Westinghouse Air Brake Company, at Allegheny City, Pa., are being operated only half time at present, owing to a lack of orders.

Last week notices were sent out by the Westinghouse Electric Company, of Pittsburgh, that a special meeting of the stockholders of the company will be held June 27 to consider a proposed agreement between the company and the Westinghouse Electric and Mfg. Company, by which certain stocks, claims and accounts of the former company will be transferred to the Westinghouse Electric and Mfg. Company. This is regarded as a move to consolidate under one charter the present electric company and all their branches or controlled and leased corporations with one name and one set of officials, thus economizing greatly in the matter of running expenses.

Chaplin, Fulton & Co., Limited, of Pittsburgh, manufacturers of syphon pumps, injectors and a general line of machinery, report that they have recently secured orders for the entire systems of



gas regulators from the Dayton Natural Gas Company, of Dayton, Ohio; the Wayne Natural Gas Company, of Fort Wayne, Ind., and the Indiana Piping and Construction Company, of Logansport, Ind. They have already shipped to Dayton 2 12-inch high-pressure regulators and 3 8-inch low-pressure regulators, which are now in operation and which will be followed by 12 6-inch low-pressure regulators to complete the system. Their order from Fort Wayne calls for 2 12-inch high-pressure regulators and 12 6-inch low-pressure regulators. At Logansport they have 2 8-inch low-pressure regulators and 5 6-inch low-pressure in operation.

Burnham, Parry, Williams & Co., of the Baldwin Locomotive Works, are about to add still further to their already extensive plant by the erection, at Fifteenth and Spring Garden streets, Philadelphia, of two large buildings for the more convenient prosecution of their business. One of the buildings will be six stories high, with a front on Spring Garden street of 80 feet and depth of 80 feet. This is called the pattern-storage building. Connected with this, on Fifteenth street, and running south 188 feet, with a width of 34 feet, is to be a one-story sand and oil house. Both buildings will contain vaults and cellars, the roofs of which are to be covered with asphalt paving blocks, and the floors concrete. All the inside doors are to be made fire-proof. The cost is about \$75,000.

Freeman Wire Company, St. Louis, Mo., are filled with orders, so much so that they have been compelled to increase their working force. Among orders lately received by them they mention wire and iron cemetery railings, an elevator front for a large manufacturing establishment in St. Louis, and a number of orders for office railing, &c., for local points.

A contract for two large duplex gas compressors and boilers for the Kentucky Rock Gas Company was placed with the Clayton Air Compressor Works, No. 43 Dey street, New York. The compressors have a capacity of 2,000,000 cubic feet per day and are to compress the natural gas at the wells to a pressure of 200 pounds per square inch and force it a distance of 82 miles to Louisville, for light and power purposes. That the Clayton air compressors are eminently suitable for this purpose has been demonstrated by their performance at the natural gas fields of Bradford and Wellsville.

The Thomson Electric Welding Company have removed their offices from the Mason Building to the new Fiske Building, 89 State street, Boston, where they have more commodious rooms. At the works in Lynn, Mass., 80,000 square feet of floor-space have been recently added and a large quantity of new machinery has been put in.

Among the recent purchasers of the patent friction covering for pulleys now being manufactured by the National Pulley Covering Company, of Baltimore, are the following: Eagle Lock Company, Terryville, Conn.; W. H. Hyde & Son, Newark, N. J.; J. E. Clarke, Columbia City, Ind.; James Clarke, Warren, Pa.; A. E. Spink & Co., Washington, Ind.; J. G. Hoffman & Sons, Wheeling, W. Va.; Smelting Works, Salt Lake City, Utah; G. W. Campbell & Sons, Kane, Pa.; Eagle Pencil Company, New York; Schultz Bros., Philadelphia, Pa. The company have recently appointed S. C. Nightingale & Childs, 134 Pearl street, Boston, their agents for New England.

#### Hardware.

The Gulf Wire Mill Company have commenced operations at New Orleans, manufacturing barb wire for the Southern market. Hitherto all the wire of this kind used in the Southwest—and very

large quantities of it are consumed in Texas—has been brought from the Eastern mills by way of New York, or from St. Louis. A short time ago the company were organized for the manufacture of barb wire. Ground was purchased on the corner of St. Joseph and Peter's streets, and works erected. The factory has a capacity of 40,000 pounds of wire per day, to be increased if the business is found to be profitable. Max Herman is president of the new company, I. M. Wiemann vice-president and Fred. Peters secretary. They claim that the wire can be manufactured at New Orleans at from 10 to 15 per cent. cheaper than in the East.

The plant of the Braddock Wire Company, at Rankin Station, Pa., will close down on the 29th inst. for the purpose of making repairs. We are advised that the company have had under consideration for some time the advisability of erecting a small steel plant for the purpose of making their own steel. The question will probably be decided in the course of a few weeks.

On the 6th inst. the Freeman Wire Company, of St. Louis, filed notice of incorporation, the capital stock being \$750,000. The stockholders are John W. Harrison, John M. Harrison, David L. Field, C. S. Freeman, Thos. W. Freeman and Thomas Drennan.

#### Miscellaneous.

The Wayne Works, of Richmond, Ind., have recently been reorganized under the name of the Creamer & Scott Company, of which Thomas Creamer is president and Thomas D. Scott secretary and treasurer, with a paid-up capital stock of \$50,000. The company have removed their plant from Richmond to Indianapolis, where they have complete facilities for the manufacture of their specialties—namely, road-carts, stick-wagons, piano-box buggies, &c. The new works are located on the corner of Eighth street and Lake Erie and Western Railroad.

The McElroy Car Heating Company, of Detroit, and the Sewell Car Heating Company, of Portland, have amalgamated, with a capital of \$2,500,000. Robert C. Penger, of Albany, is president, and S. Hatch, of New York, is vice-president.

The following recent orders have been received at the Philadelphia Scale and Testing Machine Works of Riehle Bros.: One 60-ton self-adjusting railroad-track scale for the Thomas Iron Company, Hokendauqua, Pa.; one 500-pound wire-tester for Blasius & Sons, Philadelphia; one 10-ton wagon-scale for Johnson Foundry, Johnstown, Pa.; two extra-heavy furnace charging scales for Tennessee Coal, Iron and Railroad Company, Chattanooga, Tenn.; one extra-heavy furnace charging scale for Woodstock Iron Company, Aniston, Ala.; one Weighmaster frame and standard, made to Turkish standard, for Algeria; United States standard weights for R. & A. Hecksher, Swedenland, Pa.

The Louisville and Nashville Railroad Company have just given out a contract for 500 refrigerator cars, 300 going to the Missouri Car and Foundry Company, of St. Louis, and 200 to the Ohio Falls Car Company, of Jeffersonville, Ind. The company have placed orders for their season's wants of spikes with the Tredegar Iron Works, for splice-bars with the Springfield Iron Works and for bolts with the Upson Nut Company. The company are double-tracking their short line to Cincinnati for a distance of about 30 miles and the main stem south for about 20 miles.

The people of Oxford, Chenango County, N. Y., are anxious to have a foundry established there, and set forth the numerous advantages presented by the locality.

#### PERSONAL.

Thomas W. Fitch, who has been superintendent of the Braddock Wire Company, Rankin Station, Pa., since their organization, has tendered his resignation, to take effect on July 1.

Henry Phipps, Jr., of the well-known firm of Carnegie, Phipps & Co., Limited, at Pittsburgh, has offered to erect an aquatic plant department to be located adjoining the greenhouses in the parks of Allegheny City. The offer has been accepted and work on the building will be commenced at an early date.

The Birmingham Rolling Mill Company, of Birmingham, Ala., held their annual meeting recently, electing the following officers: G. W. Norton, president; W. B. Caldwell, vice-president; B. du Pont, treasurer. Directors: John B. McFerrer, W. W. Hite, W. P. Harney and J. G. Caldwell, all of Louisville, Ky. Thomas Ward is general manager of the mill, and John D. Dwyer is superintendent in charge of the mill departments.

Dexter Brackett, of Boston, was elected president of the New England Water-Works Association.

S. T. Wellman, formerly superintendent of the plant of the Otis Iron and Steel Company, at Cleveland, Ohio, has accepted the position of consulting engineer for the Illinois Steel Company, of Chicago, comprising the consolidated Chicago mills.

E. L. Harper, who wrecked the Fidelity Bank, of Cincinnati, is said to be directing a large iron business from his prison.

Thos. W. Wetherald, for a number of years manager of the nail factory of the Bellaire Nail Works, at Bellaire, Ohio, died at his residence in that place on the 17th inst. William Sharp has been appointed his successor.

The Master Mechanics' Association, whose sessions were held at Niagara Falls last week, elected officers as follows: President, R. H. Briggs, Memphis, Tenn.; first vice-president, John Mackenzie, Cleveland, Ohio; second vice-president, Albert Griggs, Providence; secretary, Angus Sinclair, New York; treasurer, O. Stewart, Charlestown, Mass.

J. K. Taggart, for a number of years superintendent of the coke plant of the Connellsville Coke and Iron Company, situated in the Connellsville region, has resigned his position to engage in the iron business with his father in Philadelphia. He has been succeeded by J. H. Paddock, chief engineer of the H. C. Frick Coke Company.

J. Adachi, an officer of the Japanese Government, who has been in this country three years under instruction, has attained conspicuous proficiency in engineering and geology and now returns home to make practical use of his knowledge.

Theodore Sturges, president of the Oxford Iron and Nail Company, sailed for Europe yesterday, to be absent until September. Samuel Sloan will act as president *pro tempore*.

The annual meeting of the stockholders of the Bethlehem Iron Company was held at Bethlehem, Pa., on Tuesday. The meeting was a large one, and nearly all stock was voted. The following board of directors was chosen: John Knecht, R. H. Sayre, Sr., Joseph Wharton, E. P. Wilbur, W. W. Thurston, R. P. Linderman and George H. Myers. Subsequently the new board organized, with the following officers: President, W. W. Thurston; vice-president, R. P. Linderman; treasurer, C. O. Brunner; secretary, Abraham S. Schropp. There has been no change made in the management of the works, all of the officers remaining the same.

# The Iron Age

New York, Thursday, June 27, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## The Texas Trust Law.

In another part of this issue will be found the exact text of the law against trusts and combinations which is now in full force and effect in the State of Texas. This law has been alluded to in the daily press, and in some cases commented upon at length, but its provisions have very seldom been stated explicitly. With the law itself before them, our readers will be able to perceive to their own satisfaction how the Texas law-makers have proposed to deal with trusts. The question has undoubtedly been handled most vigorously and with a very earnest determination to settle it thoroughly and completely. The members of the Legislature realized that a gigantic evil was threatening the business interests of the State, and they proceeded, metaphorically speaking, to "pound the life out of it." For fear that the evil might not be recognized in some of the numerous shapes it had been known to assume, they first laid down a definition of a trust, which is so broad and sweeping that it includes all kinds of agreements covering manufacturing, transportation, selling or purchasing any article or commodity whatever. This definition is well worthy of careful study. It is an aggregation of the popular but often misinformed theories regarding trade associations. No trade association whatever can exist in Texas if the provisions of this definition are strictly applied. All such associations can be construed to affect the price, production or transportation of merchandise in some way, because they may "increase or reduce the price of merchandise or commodities," both of which they are forbidden to do by this act.

Corporations chartered by the State of Texas violating the provisions of the law forfeit their charters, and foreign corporations thus acting are prohibited from doing any business in the State. Principals, managers, directors, agents, servants or employees who carry out the purposes of trusts or combinations are punishable by a fine of \$50 to \$5000 and an imprisonment of one to ten years, each day in which the act is violated constituting a separate offense. Anything more sweeping than these clauses of the act could hardly be devised, and he would be a reckless man indeed who would subject himself to such penalties, if the law is really being carried out in its strict construction.

But the most remarkable feature of this law is the declaration as to the evidence required to prove the existence of a combination or trust. "The character of the trust or combination alleged may be established by proof of its general reputation as such." It is not necessary to prove or produce any article of agreement or any written instrument, "or that it was evi-

denced by any written instrument at all." This would cover even such cases as the Steel Rail Association, which everybody in the trade knows has no control whatever over prices, but concerning which there is a popular belief in outside circles that it is a full-fledged combination. Agents for steel-rail manufacturers and for manufacturers of iron and steel in numerous other forms have need to exercise much caution in making sales in Texas, as they are all popularly believed to be members of trade organizations of some kind, and such belief is sufficient evidence to lead to conviction by Texas juries. The manufacturers themselves, though they may never visit the State, are equally liable to punishment with their agents, the object of the act "being to reach and punish all persons offending against its provisions, whether within or without the State." But this view of the law carries with it so many palpable absurdities that it seems almost unreasonable to suppose that attempts will be made to enforce the penalties prescribed.

While contracts or agreements made in violation of this act are pronounced by it "void and not enforceable," a singular oversight on the part of its framers is to be observed. No penalties are specified against those who purchase commodities from the trusts or combinations. A stringent, hit-all-around measure like this should have taken cognizance of the misguided people who will insist on patronizing concerns bound together by compact "to increase or reduce the price" of merchandise. Such people are equally at fault with the sellers, and a provision should have been specially incorporated in the law for their punishment.

A peculiarity of the law is its non-application to the farmer. One section specifically declares that "the provisions of this act shall not apply to agricultural products or live-stock while in the hands of the producer or raiser." Farmers are free to combine and refuse to take less than a certain price for wheat, corn, cotton, hogs, milk, &c., and if they do so they are held blameless. But woe betide the wheat, corn or cotton merchant, the pork-packer or the milk vender who effects an understanding with others in his line of trade to sell at a certain price! For every day during which such an understanding prevails he is liable to a fine of \$50 to \$5000 and an imprisonment of one to ten years. This seems to be such a flagrant discrimination between occupations as to bring the constitutionality of the act in serious question. At all events, it arrays the agricultural interests against all the other industrial interests of the State, combining with the latter the commercial and transportation interests.

The appearance of the Texas law at this juncture forms a most interesting chapter in the history of the trust and combination era which is now on us. It represents very forcibly the dominant sentiment in a large section of the country that the farming interest is at the mercy of the commercial, manufacturing and railroad interests, and that a remedy for this state of affairs must be found. But it is a striking display of crude legislation; its very wide application, threatening severity and most forbidding harshness being well calculated to defeat the very objects for which it was framed.

## Northwest Freight Rates.

The week has been an exciting one in railroad matters. The rate situation in the Northwest is one which has great interest for merchants in the East, in Chicago and in the territory named. In spite of the great increase in local manufacturing, a large part of the articles used in the Northwest comes from the States east of Chicago. If the freight rates to St. Paul are all made up by adding the Chicago local to the rate from the factory or seaboard to Chicago, and if the through rates by any route conform to this standard, then all jobbers, those in Chicago included, can sell in Dakota and Minnesota on even terms. This has been the theory on which tariffs have for years been made up, so that it seems a pity that anything should occur to throw so nicely an adjusted balance into confusion. But freight rates, like channels of trade, find at last ways of breaking bounds and yielding to natural laws. As the presence of ore and coal determines the successful furnace, so cheap water routes must fix the basis for freight tariffs.

In the beginning of the season the lake rate first class from New York to St. Paul was fixed at 89 cents, while to Chicago it was 51 cents on traffic for St. Paul. This left the roads north of Chicago an opportunity to secure St. Paul traffic at a rate of 38 cents. This they were glad to do. Since to cut these Chicago roads off from all the flour down and merchandise up was no part of the programme, the owners of the Lake Superior boats were easily induced to make this higher rate from New York to St. Paul or Duluth than to Chicago, thus leaving the margin spoken of north from Chicago. This higher rate to St. Paul than to Chicago also allowed the Chicago jobbers to sell the Northern trade as usual. There was one defect at least in this plan. By water Duluth is as near to Buffalo as Chicago is, and although the amount of traffic on the upper lakes is not so great as on Lake Michigan, yet an increase in the rates much less than 35 cents per cwt. would have served to balance this lighter trade so as to have allowed the Superior boats an equal profit. Thirty-five cents per 100 was, however, the difference agreed upon on first class, because of the trouble to the Chicago-St. Paul roads if any less amount of difference was made.

Geographical considerations asserted themselves and the claims of St. Paul and Minneapolis for tariffs fixed on water distances from the sea-board were made. One road said that the rates to St. Paul should be fixed on a fair profit to the carriers without regard to the Chicago lines at all. This road figured this at 69 cents, and the lines which had early in the season named 89 cents now offered 54 cents in a spirit of protest against any offer under their original figures. Meanwhile the Chicago roads were getting roundly denounced by the jobbers of that city because the locals were so much higher than the proportion of the through. This was getting to be a serious matter; for if St. Paul should by any means get an independent tariff by any route, the effect in time would be a loss to Chicago of nearly all the jobbing trade of that important section. It may be that the end of the present war will be the restoration of the old high rates, but if so the con-

ditions of the case are such that it seems hardly possible that those high rates will be permanent.

If we understand the matter, it seems only a question of time when St. Paul, by its water transportation, will have tariffs to and from the sea-board as low or nearly as low as those ruling east of Chicago. This would mean trouble for the jobbers of Chicago, and as far as they are concerned is to be regretted. But what is a loss to Chicago would be a gain to St. Paul, Minneapolis and the whole Northwest. But Chicago will not easily let the trade of the Northwest go if she can help it. The roads can rely upon it that every means will be tried, every legal point taken which will avoid such a loss. And some way may yet be devised by which the difficulties will be smoothed over and the old tariff basis be retained.

### Our Increased Domestic Export to Australia.

The Australian colonies have imported unusually large amounts of foreign merchandise of late years, considerably in excess of their exports, and it is gratifying to note that the United States has had a goodly share in the increase. Following are the latest official statistics showing the foreign trade of those colonies, taking two years together and comparing them with the previous equal period:

#### Import and Export in 1886 and 1888.

	Import.	Export.	Excess of Import.
Victoria...	\$26,575,179	\$27,947,079	\$2,228,100
New South Wales...	44,338,744	32,007,958	12,240,786
Queensland...	12,525,717	10,177,374	2,348,343
South Australia...	10,401,153	10,125,263	275,890
West Australia...	1,406,804	1,077,085	331,769
Tasmania...	3,514,053	2,645,253	867,800
New Zealand...	14,238,994	13,492,730	746,264
Totals...	\$123,001,584	\$96,982,572	\$26,019,012

#### Import and Export in 1887 and 1888.

	Import.	Export.	Excess of Import.
Victoria...	\$42,994,235	\$25,304,906	\$17,789,327
New South Wales...	30,691,793	30,354,682	336,111
Queensland...	12,385,743	11,078,325	707,418
West Australia...	1,332,690	1,209,310	123,380
Tasmania...	3,307,480	2,783,236	524,244
			\$19,379,535
South Australia...	10,509,911	12,314,878	1,804,967*
New Zealand...	12,197,415	14,683,494	2,486,079*
Totals...	\$122,250,222	\$107,180,783	\$15,069,439
Net excess of import...			\$15,073,739

\*Excess of export.

The excess of import, which, for example, in Victoria was very large in 1887 and 1888, has, of course, chiefly arisen from the rapid extension of railroads and telegraphs. On January 1, 1887, 8881 miles of railway were in running order and 1992 miles building; the telegraphs measured in length at the same date 37,099 miles of line, with 71,859 miles of wire, there being 1921 officers and 9,021,610 telegrams forwarded in 1886. Simultaneously the mail department handled in 5236 offices 150,435,626 letters and postal cards and 82,363,194 newspapers. American trade presents the following figures:

Calendar year.	Import into the United States.	Domestic exports to Australasia.
1887...	\$4,898,232	\$12,608,701
1888...	4,613,218	9,442,150
Increase .....	\$285,014	\$3,166,551

The increase of exportation in a single year has been 33 per cent., and this in the face of the comparatively small amount of

goods we import from Australasia. The ports of New York, Boston and Philadelphia received during the fiscal year ended June 30, 1888, only 15,738,510 pounds of Australian clothing wool—and of these only 5,046,245 pounds direct—out of a total import of 111,982,093 pounds. What little we consume of Australian tin for the most part reaches us via London. Our goods, whether they be hardware or manufactures of wood and leather, including carriages, have fortunately been gaining in popularity in Australia year after year, and the remarkable increase in the amount taken in 1888 abundantly proves that this trade, properly conducted, is capable of as great expansion as to any other non-European country, small as the population is, for it barely reaches 4,000,000 at present. What has astonished the world most is this very circumstance of a comparatively small population being able to produce such enormous amounts of goods and taking in return even greater amounts. The only way to explain it is that the Australasians are very active and enterprising; that what they produce is very valuable, as, for example, wool and the metals; that their resources are great and manifold and their methods of production the best suited to the locality; and finally that at least in the cities modern civilization is carried to as high a degree of refinement and rests on as solid a basis as anywhere in the United States or Europe. They have long learned to buy the best even if it be a little dearer.

There is only one serious drawback in Australia so far as wool and cereal production are concerned—namely, the frequent prolonged droughts, leading at times to a fearful degree of mortality among sheep, and this explains the fluctuating amounts of wool yearly turned out. But, on the whole, production of the latter has been steadily on the increase, and in 1886 Australasia exported 478,998,092 pounds, toward which New Zealand contributed 90,858,744 pounds, the amounts leaving the latter colony having been as follows during 1883-87:

Year.	Pounds.	
1883 .....	68,149,430	\$3,014,311
1884 .....	81,190,028	3,597,527
1885 .....	89,507,431	3,205,275
1886 .....	90,858,744	3,672,971
1887 .....	83,125,322	3,231,074

#### The number of sheep was as follows:

Year.	Number of sheep.	Year.	Number of sheep.
1883 .....	13,300,329	1886 .....	14,774,330
1884 .....	13,973,530	1887 .....	15,155,638
1885 .....	14,546,801		

The average production of wool per sheep in all 1886 throughout Australia was 4½ pounds. The rise in wool three years ago, since maintained, has, of course, contributed greatly toward improving Australian affairs and finances, 1d per pound making a difference of \$10,000,000 per annum. The exportation to England of wheat and mutton, the latter in refrigerator steamers, is at times important, although in the latter item the Argentines are becoming competitors not to be despised. New Zealand exports to the United States many cargoes of Rauri gum annually, a fossil rosin used for varnish manufacture, supposed to be a very profitable trade. Australia is, from a commercial point of view, one of the most promising countries we deal with. It is reported per cable from Sydney, June 21, that the New South Wales Government have decided to continue for a year from next November the contract for carrying

the mails between that port and San Francisco. This is important at a time when, as we have shown, the Australian trade we are carrying on is taking a fresh start.

### British Statistics for 1888.

The annual statistical report of J. S. Jeans, secretary of the British Iron Trade Association, has just been received. It contains a mass of valuable statistics relative to the British iron trade, as well as much information concerning the iron trade of other countries, the whole comprising a volume of 128 pages. An epitome of the British statistics of production, exports and imports is given in the following table, in which the figures for 1888 are compared with those for 1887:

Description.	1888.	1887.
	Tons.	Tons.
Production:		
Total pig-iron.....	7,893,834	7,441,927
Bessemer pig-iron.....	3,245,555	3,054,573
Basic pig-iron.....	475,540	471,510
Spiegelisen and ferro..	205,184	223,190
Puddled bar.....	2,061,473	1,701,312
Bessemer steel ingots.....	2,012,784	2,064,406
Bessemer steel rails.....	979,085	1,021,547
Basic steel.....	408,594	364,526
Open-hearth steel ingots	1,222,743	981,104
Iron ore .....	14,168,000	13,068,041
Coal.....	169,935,219	162,119,812
Stocks pig-iron Dec. 31..	2,566,708	2,773,684
Ship-building tonnage launched.....	904,329	577,327
Exports:		
Total iron and steel.....	3,966,934	4,145,907
Pig-iron.....	1,038,177	1,159,500
Railroad iron and steel..	1,020,324	1,013,631
Tin-plates.....	181,391	254,773
Coal.....	26,935,492	24,454,607
Imports:		
Iron ore .....	3,562,071	3,765,738
Beams, &c.....	69,312	69,306
Bars, angles, &c.....	113,263	112,379
Steel, unwrought.....	12,058	14,757
Unenumerated iron, &c..	157,799	129,680

These figures show how satisfactory was the business of 1888 as compared with 1887. In nearly every instance the figures of production show an increase, which is in some cases very heavy, while the branches in which there was no increase have been holding their own very well. The export trade has also been sustained very satisfactorily. Stocks of pig-iron decreased to some extent during the year.

The most remarkable increase in production shown in this table was in open-hearth steel, which is mainly due to the larger employment of steel in ship-building, although no inconsiderable part of the enlarged output was worked into tin-plates. The increased production of pig-iron is not so notable, as Great Britain surpassed the figures for 1888 in that line in both 1882 and 1883 by 600,000 tons. Never before was the production of open-hearth steel so large, the output of 1886 having been almost doubled, while there was a gain of nearly one-third on the figures for 1887. The only statistics available regarding tin-plates are those relating to exports, as the makers seem to withhold their figures of production. With reference to this branch of trade, Secretary Jeans says: "The position and prospects of the industry at the present time are very uncertain. There is a probability of a year of good trade, and the quantity produced is increasing, but much will depend upon how far the movement which is in progress in the United States for the establishment of a home tin-plate industry is successful." Of the total British exports of tin-plates, no less than five-sevenths are sent to this country.

For the purpose of comparison with this country we present below the leading statistics of iron and steel production in the United States in 1888 and 1887:

	1888.	1887.
Pig-iron.....	Gross tons. 6,499,738	Gross tons. 6,417,148
Bessemer steel ingots.....	2,511,161	2,936,033
O. H. steel ingots.....	314,318	322,069
Bessemer steel rails.....	1,388,277	2,101,904
All forms rolled iron.....	2,153,263	2,311,161

#### Manufacturing in Canada.

Stimulated by favorable legislation and favored by long credits, which the plethoric condition of the banks enabled them to extend, through the floating abroad of Government loans, manufacturing establishments in Canada seem to have been multiplied far beyond the demands for consumption. This is true of manufacturers of cotton, agricultural machinery, flour, sugar and some other lines, until this year it is true that only the strongest survive. Numerous facts touching this subject are given in the recent reports of bank managers just issued, in which discussion respecting the general interests of the Dominion is given a wide range. For example, Henry Yates, manager of the Merchants' Bank of Canada, says:

We have largely increased the productive power of our manufactories of textiles, and apparently have outbuilt the requirements of the country. Manufacturers have found an outlet by shipping large quantities of cotton goods to China, realizing no profit from the venture so far, but giving employment to workmen, keeping looms running and factories open. This, after all, is no unusual condition of things in manufacturing. . . . It does, however, teach us that if we build factories we must submit to the conditions under which factories are run, and take bad times and good times together. And we may certainly conclude that when times are good dividends should be moderate, and money set aside for a rainy day. And it teaches further that when a country has factories enough it is folly to build more. When our population is double what it is at present, or even half as much again, we can then enlarge our looms and spindles with some reason. No matter what kind of manufacture a man is engaged in, whether the raw material be cotton, wool, iron or leather, these remarks are pertinent to it. No money can, as a rule, be made out of mere staples or out of articles that everybody can make and that everybody understands. Any manufactory or mill that is built without close calculation and is carried on in a humdrum, careless manner will undoubtedly drift into loss.

To the same effect is the report of Manager Walker, of the Canadian Bank of Commerce, in reference to the manufacture of agricultural implements. Of harvesting machinery the output during the present season will be probably 10 to 15 per cent. in excess of last year, but at reduced profits, owing to the competition of large and perfectly-equipped establishments. Within four years prices have fallen, say, 20 per cent., and at the present time only 15 establishments survive of the 22 formerly in existence. Of the successful ones, moreover, four manufacture three-fourths of the entire product. In hardware, groceries, &c., the same general statements hold true. The margin of profits is growing smaller, the expenses of conducting business greater, and as a consequence the tendency is in the direction of the large firms, whose proportion of expenses to sales can be kept within reasonable limits, gradually absorbing the trade.

In other words, the leading lines of general business in Canada seem to have been overdone, with the inevitable consequence

of many bad debts, and thus it comes about that Canadian manufacturing interests, which have been so enormously developed of late, realized during the past year a poor return on their capital. A part of the difficulty is attributed to the impolicy of granting long credits by banking institutions, and bank managers are unanimous in suggesting a gradual change in this respect. It should be observed, however, that in contemplating the future a more hopeful feeling is expressed, the general situation being improved by the weeding out of weak traders, as well as by sounder methods that follow where the evils of expansion have been felt. Moreover, the lumbering industry is active and profitable and crop prospects are excellent.

#### OBITUARY.

SILAS H. WITHERBEE.

Silas H. Witherbee, of the well-known iron-ore firm of Witherbees, Sherman & Co., died of pneumonia at his home in New York, on Saturday, June 8, at the age of 74 years. He had been seriously ill for several days, but his death was unexpected. We take the following statements concerning his life and achievements from a biographical sketch furnished the *Engineering and Mining Journal* by William Allen Smith:

Mr. Witherbee was born in Bridport, Vt., January 27, 1815. Losing his father when he was only five years old, he early became self-reliant. As a boy he showed the same kind heart and genial temperament which marked his later life; he excelled in feats of skill and strength, and was a noted wrestler. He had no schooling after the age of 13, at which time he left home and lived with a brother in Vermont. When 19 years old he went to Port Henry, on Lake Champlain, then almost in the wilderness, and became a store clerk with a salary of \$50 per year and board. Later he was a clerk at the blast-furnace at Port Henry, then owned by Horace Gray, of Boston. This was the opening of his career in the iron business. While here he was married in 1842 to Sophia C. Goff, the sister of the superintendent, George W. Goff. About 1846 he went to Westport, where he became superintendent of the furnace, under the management of Frank Jackson, of Boston. In 1848 he returned to Port Henry, and formed a partnership with his nephew, Jonathan G. Witherbee. This firm of S. H. & J. G. Witherbee did a large business in transporting ore, iron and other products from Lake Champlain to New York. In 1849 the firm acquired from A. G. Rousseau, of Troy, an interest in the iron-ore property adjoining the ore property of John A. Lee and George Sherman, known as the "Old Bed." In 1852 they joined with Kinsley Sherman in establishing the firm of Sherman & Witherbee, at Cleveland, for the sale of the ore in the West; and for many years before the large development of the Lake Superior mines this firm supplied the Western market with the only iron ore brought to mix with local ores. The iron-ore interests of John A. Lee, Geo. Sherman and S. H. & J. G. Witherbee were consolidated in 1856 under the firm name of Lee, Sherman & Witherbees; in 1861 the firm of Witherbees, Sherman & Co. was established, the other three partners buying out the interest of Mr. Lee. The firm have continued to the present time under the same title and rank among the largest ore producers of the country.

In 1863 the Witherbees with F. P. Fletcher erected a charcoal blast-furnace near Mineville (the name given by them

to the town which grew up around their ore beds) and from "New Bed" ore produced some of the first Bessemer pig-iron made in this country. In 1864 the firm acquired an interest in the adjoining property of the Port Henry Iron Ore Company. From that time the two concerns have been closely associated, with Witherbees, Sherman & Co. as sales agents. Their sales of ore have in some years reached nearly 500,000 tons. Mr. Witherbee was the first president of the Cedar Point Iron Company, whose furnace, built in 1873, was subsequently purchased by Witherbees, Sherman & Co., and was the first in the country to use Whitwell's hot-blast stoves.

In 1879 Mr. Witherbee was a director in the Bay State Iron Company, at Port Henry, and upon its later reorganization became president of the same furnace company with which he had started years before as clerk. At the time of Mr. Witherbee's death he was the senior member of the firm of Witherbees, Sherman & Co., vice-president of the Port Henry Iron Ore Company, vice-president of the First National Bank of Port Henry, president of the Port Henry Furnace Company, director of the Lake Champlain and Moriah Railroad Company and of several other corporations in different parts of the country. The business life of Mr. Witherbee was characterized from beginning to end by energy, sagacity and fidelity. Starting as an industrious and faithful subordinate, he advanced gradually and surely to a position of honored leadership. The nature and extent of his business made him among the best-known of our iron men. He was, in the best sense, a self-made man, but conspicuously free from egotism or ostentation. Through his whole life he preserved a winning simplicity of manner, which, with his kindly shrewdness, gave him the faculty of attaching warmly to himself all who had near relations to him. His patience and large charity were well known, and his naturally even temper was hardly ever disturbed. Mr. Witherbee's family life was singularly happy. The wife of his youth survives him, and he leaves three children, two daughters and one son, Walter C., a member of his firm, residing at Port Henry.

JAMES S. MARSH.

James S. Marsh died on June 16 at his residence, in Philadelphia, in the 68th year of his age. Mr. Marsh was born in Cayuga County, N. Y., November 11, 1821. When 20 years of age he removed to Lewisburg, Pa., where he introduced the manufacture of cooking stoves, being one of the first to engage in that business in Pennsylvania. There he established the Lewisburg Foundry. In 1851 Mr. Marsh became one of the firm of Beaver, Marsh & Co., manufacturers of pig-iron, at Winfield, Union County. Later he became interested in the manufacture of agricultural implements and was the original patentee of the revolving self-raking reaping machine. Mr. Marsh continued in that business until 1878, when his works were destroyed by fire, since which time he had not been engaged in any business. He leaves six sons and one daughter, all adults.

WILLIAM H. SCRANTON.

William H. Scranton, for many years general manager of the Oxford Iron and Nail Company, of Oxford, N. J., died on the 19th inst. from heart failure, having been taken ill with pneumonia three days before. He was general manager of the Fall River Iron Works up to the time of the sale of their plant, and then became interested in the Wenstrom ore-separator, with Robert A. Cook. He was but 49 years old at the time of his death.



## The Homestead Wages Scale.

In our issue of May 23 we made mention of the fact that Carnegie, Phipps & Co., Limited, of Pittsburgh, had decided to put in operation at their Homestead Steel Works a sliding scale of wages, to go into effect on the 1st day of July. In the early part of this month William Weihe, the president of the Amalgamated Association, requested that the firm furnish him a copy of the proposed scale, which was done. A portion of this scale was printed in the *National Labor Tribune*, and also circulated among the delegates in attendance at the Convention of the Amalgamated Association of Iron and Steel Workers. This led W. L. Abbott, chairman of Carnegie, Phipps & Co., Limited, on the 12th inst., to address a letter to Mr. Weihe, which we publish in part as follows:

"DEAR SIR: When, on Tuesday last, you asked for and were given a copy of the scale of wages submitted to our employees of the Homestead Steel Works, you were told that the same caused an average reduction in the rates at present paid of, approximately, 20 to 25 per cent. It was explained to you that the greater part of this cut was taken from the wages of those men whose earnings are abnormally high under existing Amalgamated rates, made so in part by reason of the exceptional facilities we possess and the special character of the product of the Homestead Works. My attention has to-day been called to the fact that the men at Homestead are circulating printed copies of the scale that was given you. In a parallel column is published the present tonnage rates, but the estimated tonnage of each turn contained in our copy has been omitted from that the men have had printed. A perfectly correct understanding of our proposition is impossible if all features of the scheme are not exhibited. Permit me to submit some figures for your consideration. They show the wages that would have been earned under the new scale, based upon the actual output of the Homestead Steel Works for the month of May, 1889:

## Converting Mill.

Position.	Number of men.	Rate per 100 tons.	Daily earnings as estimated on basis of May tonnage.	Earnings for May of each man.	Actual daily earnings, basis of May tonnage.
Cupola man.....	1	\$1.70	\$3.75	\$126.00	\$5.04
Vessel man.....	1	1.70	3.75	126.00	5.04
Pourer.....	1	1.60	3.50	117.80	4.71
Blower.....	1	1.48	3.25	109.65	4.39
Spiegel man.....	1	1.38	3.00	100.75	4.03
Pit men.....	10	1.36	3.00	100.75	4.03
Stopper-setter...	1	1.25	2.75	92.60	3.70
Ladle man.....	1	1.18	2.50	87.40	3.49
Cupola helpers...	2	1.14	2.50	84.45	3.38
Bottom-makers...	1	1.14	2.50	84.45	3.38
First regulator...	1	1.09	2.40	80.75	3.23
Crane shifters...	3	1.09	2.40	80.75	3.23
Vessel man's first helper.....	1	1.09	2.40	80.75	3.23
Cinder men.....	3	1.09	2.40	80.75	3.23
Vessel man's second helper.....	1	1.02	2.25	75.55	3.02
Bot.-m'k'r's helpers.....	2	1.00	2.20	74.10	2.96
Mold-sanders.....	2	1.00	2.20	74.10	2.96
Cinder tapper.....	1	.95	2.10	70.40	2.81
Rack man.....	1	.95	2.10	70.40	2.81
Iron-crane man...	1	.95	2.10	70.40	2.81
Ingot-extractor...	1	.95	2.10	70.40	2.81
Stopper-maker...	1	.95	2.10	70.40	2.81
Metal-wheelers...	8	.91	2.00	67.40	2.70
Cinder-snappers...	2	.91	2.00	67.40	2.70
Ladle man's helper.....	1	.91	2.00	67.40	2.70
Ingot-extractor's helper.....	1	.91	2.00	67.40	2.70
Coke-wheelers...	2	.88	1.90	63.70	2.55
Second regulators.....	3	.86	1.90	63.70	2.55
Mold washer.....	1	.86	1.90	63.70	2.55
Steel-crane man...	1	.86	1.90	63.70	2.55

Total tonnage, 14,818 tons; tonnage per turn, 7409 tons.

## 28-Inch Blooming Mill.

Screw man.....	1	\$3.10	\$6.00	\$150.00	\$6.00
Heater.....	1	3.10	4.50	118.00	4.72
Rougher.....	1	2.59	3.75	98.50	3.94
Point-in-hook...	1	1.90	2.75	72.25	2.89
Shear man.....	1	1.90	2.75	72.25	2.89
Turn-up-book...	1	1.90	2.75	72.25	2.89
Bottom men.....	2	1.79	2.60	68.10	2.72
Hookers.....	3	1.72	2.50	65.40	2.62
Furnace men.....	6	1.55	2.25	58.95	2.36
Tong man.....	1	1.55	2.25	58.95	2.36
Shear man's help.	1	1.52	2.20	57.80	2.31
Dragout.....	1	1.52	2.20	57.80	2.31
Butt-wheeler...	1	1.38	2.00	52.50	2.10
Pull-around.....	1	1.38	2.00	52.50	2.10
Shear pulpit.....	1	1.21	1.75	46.00	1.84
Pulpit man.....	1	1.21	1.75	46.00	1.84
Cover men.....	2	1.14	1.65	43.35	1.73

Total tonnage, 7808 tons; tonnage per turn, 3804 tons.

## 28-Inch Mill.

Roller.....	1	*	\$6.00	\$140.00	\$5.60
Heater.....	3	\$6.92	4.50	89.25	3.57
Catcher.....	1	5.77	3.75	74.43	2.98
Rougher-down...	1	5.38	3.50	69.40	2.78
Rougher-up.....	1	4.62	3.00	54.60	2.38
Sticker-in.....	1	4.23	2.75	54.60	2.18
Straightener.....	1	4.23	2.75	54.60	2.18
Heater's first helpers.....	3	4.00	2.60	51.60	2.06
Hookers.....	6	5.69	2.40	47.60	1.90
Hot -straighten- ers.....	2	3.46	2.25	44.60	1.78
Buggy man.....	1	3.46	2.25	44.60	1.78
Heater's second helpers.....	3	3.23	2.10	41.65	1.67
Chargers and drawers.....	8	3.23	2.10	41.65	1.67

Day turn, 1290 tons.  
In addition to the above, wages of 13 men, making \$14.50, changing rolls, which is not included in earnings.  
\* \$1 per month and 3 1-10.

## 38-Inch Beam Mill.

Roller.....	1	\$ *	\$5.80	\$166.20	\$5.65
Heaters.....	3	\$11.00	4.50	132.40	7.20
Catcher.....	1	8.99	4.00	147.40	5.90
Rougher-down.....	1	7.78	3.50	129.00	5.16
Rougher-up.....	1	7.22	3.25	119.70	4.79
Straighteners.....	2	6.67	3.00	110.60	4.42
Hookers (front).....	4	6.11	2.75	101.30	4.05
Sticker-in.....	1	6.11	2.75	101.30	4.05
Heater's 1st help- ers.....	3	5.78	2.60	95.80	3.83
Chargers.....	4	5.55	2.50	92.00	3.68
Hookers (back).....	3	5.55	2.50	92.00	3.68
Buggy man.....	1	5.00	2.25	82.90	3.31
Heaters 2d help- ers.....	3	4.67	2.10	77.40	3.09
Buggy man's helper.....	1	4.67	2.10	77.40	3.09
Hot-bed men.....	4	4.67	2.10	77.40	3.09
Saw man.....	1	4.67	2.10	77.40	3.09
Rack man.....	2	4.44	2.00	73.60	2.94
Straightener's helpers.....	12	4.44	2.00	73.60	2.94
Hydraulic tele- graph.....	1	3.78	1.70	62.65	2.50

Total tonnage, 3317 tons; tonnage, one turn, 1658 tons.  
\* \$100 per month and \$4.

## 119-Inch Plate Mill.

Rollers.....	1	*	\$6.80	\$181.50	\$7.26
Screw man.....	1	\$6.03	5.00	145.65	5.83
Shear man.....	1	8.93	5.00	145.65	5.83
Table man.....	1	8.04	4.50	131.10	5.24
Heaters.....	2	8.04	4.50	131.10	5.24
Second shear man	1	5.80	3.25	94.60	3.78
Hooks.....	2	5.38	3.00	87.40	3.50
Heater's helpers..	2	4.64	2.60	75.70	3.03
Sweepers.....	2	4.02	2.25	65.60	2.62
First leader.....	1	4.02	2.25	65.60	2.62
Second leader.....	1	3.98	2.20	64.10	2.56
Shear man's help- ers.....	10	3.75	2.10	61.20	2.45
Crane man.....	1	5.36	3.00	87.40	3.50
Crane man's help- ers.....	1	4.02	2.25	65.60	2.62

Product on each turn, 1631.  
\* \$100 per month and \$5.

"It will be noted that the estimated product per turn was in many instances exceeded, while in others, the 28-inch mill, for instance, the reverse is the case. It is due to ourselves and to our workmen that our position and our aim in the action that has been taken be clearly defined. As the official head of a great and influential organization, to which so many of these men acknowledge allegiance, I briefly summarize the statement made to you orally:

"1. The Homestead Steel Works cannot longer be operated successfully under a scale of wages established to apply to iron products, nor under conditions that have radically changed, and which did not contemplate the use of appliances and methods admitting of a largely-increased output without corresponding increase of labor. These improved facilities were acquired only through the outlay of large sums of money, on which capital we must have a reasonable return.

"2. To place ourselves upon an equality with our leading competitors an average

reduction of wages of, approximately, 25 per cent. is imperative.

"3. As a cure for the annual recurrence of wrangles and the dissatisfaction inevitably following the yearly agitation of the wage question, and in the interest of our men quite as much as of ourselves, a sliding scale shall be established.

"4. The scale adopted shall be operative for not less than two and one-half years.

"This action is not taken in antagonism to organized labor, but it has been forced upon us by the unreasonable and short-sighted demands of that power which, like all power not carefully controlled, is apt to be used to destroy itself. We recognize the right of every man to get for his services the highest market price. Whether, as employers, we purchase such service from the individual or from an organization which controls him is immaterial to us."

During last week several conferences were held between the firm and a committee from the Amalgamated Association, but no settlement was reached. The first conference was held on Wednesday, the 19th inst., and before any business was done the Amalgamated committee was given to understand that there were three essentials that would be insisted on by the firm: First, a reduction and a material one; second, a sliding scale; third, that whatever agreement should be reached it was to continue in force at least two and one-half years. The workers did not make any serious objection to the second question, the only objection being that they did not understand its workings and were in doubt as to its effect. They objected to the base of the scale, the firm demanding \$25 and the Amalgamated Association asking for \$27.50. The firm stated that they were willing to leave it to one man to establish the average selling price and they would allow the Amalgamated Association to name the man, only providing that he be a strictly honest man. They named President Weihe, Secretary Martin and Vice-President Roberts. Another conference was to have been held on Thursday, the 20th inst., but for some reason the Amalgamated committee did not put in an appearance and thus the matter stands. From present indications a strike is inevitable unless a settlement is reached during the present week. The entire plant of the firm will close down on the 29th inst., for the purpose of making the annual repairs. If a full complement of men can be secured the plant will be put in operation as soon as repairs are completed; if not it will remain idle until men are secured.

At a meeting of the Pittsburgh Committee of freight agents of the railroads running east of Pittsburgh, held in that city on the 22d inst., it was decided to make a reduction in the rates on iron and steel of about 3 cents per 100 pounds. The reduction was made to agree with the reduced rates put in force by the railroads from the Mahoning and Shenango valleys. The new figures go into effect on the 27th inst. and are as follows, the first named for carload lots and the last for freight in less quantities, in cents: To New York, 12 and 15; Boston, 15 and 18; Albany, 12 and 15; Utica, 12 and 15; Syracuse and Rochester, 10 and 13; Philadelphia, 10 and 13; Baltimore, 9 and 12; Washington, D. C., 9 and 12; Richmond and Norfolk, Va., 12 and 15; Portland, Maine, 19 and 22½.

Several large bridge contracts have been awarded by the Pennsylvania Railroad Company—viz., the Lewiston Bridge across the Juniata to M. P. Roberts; the Granville Bridge to the New Jersey Steel and Iron Company; May's Bridge and the Manayunk Bridge to Cofrode & Saylor. The new South Fork and Conemaugh bridges will be of stone.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 59 Dearborn street,  
CHICAGO, June 24, 1889.

**Pig-Iron.**—The syndicate of Malleable Iron manufacturers placed their order for the year's supply of Charcoal Iron last week. This is about the largest contract that is placed every year and many individual buyers never place their order for Charcoal Iron until that purchase is made. The sale was well spread out among buyers and brought out quite an active demand for this class of Iron from all sections of the West. Manufacturers of Malleables seldom contract until late in July or August, but the recent heavy purchases of Coke Iron, which firmed up the price, and the better prospects in all lines of Iron manufacture, induced them to buy earlier this year. The statement made three months ago that Charcoal would be short is again revived and to some benefit in getting orders. The furnaces that were out of blast are not taking orders at present prices because they say later, when the shortage is realized, they will have their Charcoal to make higher-priced and more profitable Iron. It matters not how much truth there is in the Charcoal shortage statement, it has had and is having its effect upon the consumers of Iron and making buyers who usually buy small lots take larger quantities. In local Coke Irons trade was very good, but nearly all the largest buyers have contracted. Ohio and Southern furnaces worked hard to sell Soft Irons and found a good many orders which they could accept under the advantage of the \$3.65 freight rate. On Lake Superior Charcoal, cash, f.o.b. Chicago, we reduce quotations 50¢ per ton, and give \$18 as the bottom price by the cheapest sellers on carloads. There are but two or three standard Irons that can be bought at these figures; other makers refuse orders at less than \$18.50 @ \$19. The balance of the changes are made on account of the reduction in freight rates from the South. We quote Local Coke, No. 1, \$15.50; No. 2, \$14.50; No. 3, \$13.50; Chicago and Bay View Scotch, \$15.50 @ \$16; American Scotch (Blackband), \$17.50; Southern Coke, No. 1 Foundry, \$15.50; No. 2, \$15; No. 3, \$14; No. 1 Soft, \$14.75; No. 2, \$14.25; Gray Forge, \$13.25; Mottled, \$18; Hanging Rock, No. 1, \$18; Jackson County, No. 1, \$17.50, immediate delivery; Southern Ohio Silvery, No. 1, \$17; No. 2, \$16; Tennessee Charcoal, No. 1, \$17.75; Alabama Car-Wheel, \$24 @ \$25.

**Bar-Iron.**—In lots ranging from 25 to 50 tons business was quite active. Merchants and manufacturers were disposed to fill up broken stocks, and wanted shipments before the close of the month. For these orders mills were enabled to get better figures than prevailed several weeks ago. Mills that accept orders for delivery later in the season do not appear quite so firm as last week. Makers' prices range from \$1.55 to \$1.60, half extras, f.o.b. Chicago, on Common, and on Single Refined, \$1.75. On Car specifications \$1.60, flat, is asked. On account of freight reductions these figures net the manufacturer better margins at mill. Store quotations are \$1.65 on Common, \$1.80 on Single Refined and \$1.90 for better grades in small lots full card.

**Structural Iron.**—Actual business is gradually improving. Each week some long-talked-of building project matures and new ones are started. The Beams (about 150 tons) for the foundation of the Rand & McNally building were let to Carnegie

last week. Other orders of a similar nature are pending. As foundries get in work prices improve, and competition is more generous. The quick demand for stock shapes has depleted the supply, and mills are beginning to hear some vigorous calls on unfilled contracts. Quotations are as follows, f.o.b. Chicago: Angles, 2.10¢ @ 2.12½¢; Universal Plates, 2.15¢; Sheared Plates, 2.20¢; Tees, 2.55¢; Beams and Channels, 2.90¢. Small lots from store: Angles, 2.20¢ @ 2.30¢; Tees 2.65¢ @ 2.70¢; Beams, 3.40¢.

**Plates, Tubes, &c.**—Buyers continue to take only small lots, which keeps sellers pretty busy, but does not make much inroad on the large stocks they have on hand. A good many inquiries have been made lately for round lots Iron and Steel Plates for July and later delivery. Quotations from store are as follows: Nos. 10 to 14 Iron Sheets, 2.50¢ @ 2.60¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 3¢; Tank Iron, 2.40¢ @ 2.50¢; Tank Steel, 2.50¢ @ 2.60¢; Shell Iron or Steel, 3¢; Flange Iron, 4¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.75¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler Rivets, 3.75¢ @ 4.25¢; Boiler Tubes, 55 ¢ off for 1½-inch and less and 60 ¢ off for 2-inch and larger. The Pipe trade are not buying heavily, but frequently. The last advance was unexpected by consumers, but so far as we can hear very well maintained by sales agents.

**Sheet-Iron.**—The demand for Sheets continues good. Mills are full of orders and very independent about taking further work for either July or August delivery. They quote on No. 27, f.o.b. Chicago, 2.90¢ @ 2.95¢. Jobbers quote from store, No. 24, 3¢; Nos. 25 and 26, 3.10¢; No. 27, 3.20¢.

**Galvanized Iron.**—In small lots trade has been quite active, but in large orders there is less doing than there was in the early part of the month. Jobbers' assortments are still in good shape, though mills are slow to accept further contracts. The heavy consumption of Black Sheets makes it difficult for galvanizers to secure stock in all numbers. Jobbers continue to quote 65 ¢ off on Juniata and 65 ¢ and 5 ¢ off on Charcoal.

**Merchant Steel.**—Business is in about the same condition as a week ago. Country merchants and manufacturers with an established consumption have lately been filling up their stocks with lots sufficient to carry them over the time that mills will be closed during the early part of July, for the purpose of repairs, &c. Some go even further and take in stock enough to carry them over the entire month in case there should be labor trouble. Light-grade Steels have been in better demand than other qualities. On Soft Bars, round lots, f.o.b. Chicago, manufacturers quote 1.90¢ rates; Open-Hearth Spring Steel, 2.25¢; Open-Hearth Machinery, 2.10¢; Tire Steel, 2.15¢; Toe Calk, 2.30¢, flat. From store jobbers quote as follows: Mixed Machinery Steel, 2.10¢ @ 2.30¢; Tire Steel, 7.75¢ @ 8.50¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.50¢ @ 3¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.20¢ @ 2.25¢.

**Track Supplies.**—Sales agents report a dearth of orders. Splice Bars are quoted at 1.55¢ @ 1.60¢; Bolts with Square Nuts, 2.50¢ @ 2.55¢; Hexagon Nuts, 2.60 @ 2.70¢; Spikes, 1.85¢ @ 1.90¢; Hot-Pressed Square Nuts, 5.85¢ discount; Hexagon Nuts, 6.85¢ discount.

**Steel Rails.**—There is no perceptible change in the condition of the market. The Illinois Steel Company have all the work they can do in their three mills for July delivery, and it may be stated, too,

that railroads apparently have all they want for the same period, as orders are scarce and not as urgent as they were the early part of the month. On Heavy Sections \$29 @ \$30 is quoted, according to time of delivery and quantity. For Light Iron Rails manufacturers are asking \$24 @ \$26 for 12-lb and \$33 for 30-lb. The demand for these continues rather active for immediate delivery, while there are a great many inquiries for Rails to be delivered later in the fall.

**Old Rails and Wheels.**—There have been but very few transactions in Old Rails for the reason that stocks are scarce and high-priced. Sellers are asking \$21 as bottom, and keeping themselves in position to decline selling should they receive an offer. Several lots are offered at \$23. Sales have been made on a basis which would be equivalent to \$20.50, f.o.b. Chicago, but it is doubtful whether the purchase could be duplicated. Old Steel Rails are quoted at \$17.25 for long lengths and \$14.50 for short pieces. Old Car-Wheels are in fairly good demand and held at \$17.50 @ \$18 by those who have any quantity of stock; \$17 has been offered without effecting sales. Sellers are not quite so firm as they were two weeks ago.

**Scrap.**—The quantity of old material offering is not so great as several weeks ago. Railroad companies are withholding their Wheels, Rails and better grades of Forge because they think that prices will advance next month. Dealers' quotations on 2000 lb are as follows: No. 1 Wrought, \$17 @ \$17.50; Fish-Plates, \$18; Car-Axles, \$21.50; Horseshoes, \$17; No. 1 Mill, \$13.50 @ \$14; No. 2 Mill, \$8.50 @ \$9; Cast Machinery, \$11; Stove Plate, \$8.50 @ \$9; Cast Borings, \$8; Wrought Turnings, \$10; Coil Steel, \$13.50; Leaf Steel, \$14.50; Locomotive Tires, \$15; Track Scrap, \$16; Mixed Country Wrought, \$12.

**General Hardware.**—Jobbers report an excellent trade on all lines of goods. It is something unusual to have their traveling salesmen send in larger orders at the close of this month than were general in May. It shows that goods are being rapidly consumed in the country, and the outlook for the balance of the year very flattering. Mail orders are also unusually large and numerous. There are no recent changes in prices on the part of manufacturers, and between jobbers they remain fairly steady on close margins.

**Nails.**—To outline the market would be to duplicate our last week's report. The only new feature in connection with the situation is another reduction in freight rates by the Canadian Pacific road from Boston to St. Paul, which goes into effect to-day. This reduction will be made by lines via Chicago to Missouri River points, and will enable manufacturers east of here to dispose of their product to jobbers and dealers in all sections at a lower price than was named last week without reducing their prices at mill. There is a wide difference of opinion on the future of the Nail market. Some manufacturers are becoming more independent, and refuse to meet prices. Jobbers who are desirous of buying continue to hammer the higher-priced makers with the price of the weaker ones for the purpose of getting a better article, and not infrequently gain their object. On carloads all Cut or all Wire or mixed jobbers quote \$1.85 rates for Cut Nails and \$2.30 for Wire Nails. In small lots Cut Nails are quoted at \$1.90 and Wire Nails at \$2.35. The demand for Wire Nails is quite active in small lots and the stocks of jobbers are much lighter than they usually carry, but the demoralized condition of the Cut-Nail trade prevents them from placing orders, as they believe that it will have a damaging effect on the price of

Wire Nails before long. In fact, several of the Wire-Nail manufacturers have in the last few days offered to take orders from jobbers for July and August delivery at 5¢ per keg less than what they were able to get last month.

**Barb-Wire.**—The manufacturers of Barb-Wire are to hold their consolidation meeting this week. The place selected is not positively known, but indications point to Cleveland or Cincinnati. The demand for Wire continues very active in small lots, on which jobbers quote \$2.75 for Painted and \$3.35 for Galvanized.

**Pig-Lead.**—Some 400 tons changed hands last week at about 3.85¢. Offerings were quite plentiful and near deliveries were the weakest options. Much uncertainty attaches to the probable decision of the Treasury Department in the Silver-Lead Ores, as for or against a duty will determine the near-future condition of the market.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., June 23, 1889.

The Iron trade is just in that condition which makes it hard to report correctly. The feeling is nervous and unsettled, with a general tendency towards higher prices, but the difficulty is to find what the ruling prices are. There are a good many that are "not quoting" at all, others don't seem to know what to quote, while a few are meeting the legitimate requirements of their customers at a trifling advance over last week's prices. The position is not without its difficulties—cost of production has already advanced considerably, and any further movement in the direction of higher prices would be certain to be met with a demand for higher wages. If an advance in prices was sure to be maintained manufacturers would probably not object to some advance in wages, but suppose the market reacts? This is the contingency which has to be met one way or other. Manufacturers are inclined to wait before committing themselves either way. The outlook is certainly encouraging, but after all a great deal depends on the action of the Western trade. If prices advance there the East is in a position to keep pace, but to secure permanency the movement must be instantaneous.

**Pig-Iron.**—The market has developed an improving tendency, and as regards Mill Irons, prices are a shade dearer. Foundry Irons are steady, but not notably higher than they were a week ago, although good brands are scarce and could not be bought for late delivery unless at some advance over the figures quoted for spot lots. Mill Irons are easily 25¢ dearer, the general asking price being 50¢ advance. There is a great deal of inquiry for Iron, and sellers express much confidence in the outlook, although the attitude of the Southern companies is not yet clearly defined. The difficulty with this class of Iron is its varied quality as well as its variety of prices. Some of the more prominent companies are sold up, and are therefore not quoting on new business. Others offer at \$14.50, \$16 and \$16.50 ex-ship, with intimations that these prices can be shaded on bids from the right kind of buyers. Quality may be as satisfactory as other Southern Irons, but as the brands have not been used to any extent in this vicinity consumers are not inclined to make offers while they can get approved brands at a trifle more money. Hence while the quotations seem low, the Iron does not attract much attention. Local brands are held at from \$17 to \$18 at tide, for No. Foundry, \$16 @ \$16.50 for No. 2 and \$15 @ \$15.50 for Gray Forge. There is not much good Iron for sale at less than \$17.50, and while \$15 has been

shaded in one or two instances for Gray Forge, the feeling is very firm, with several sales of good-sized lots at \$15.25. The market, therefore, may be called firmer all around, with the average of transactions at probably 25¢ per ton higher than the week previous.

**Blooms.**—It is a most difficult matter to quote Steel Blooms correctly. As we said last week, some of the leading makers are out of the market, others claim to be getting 50¢ @ \$1 per ton advance, while others are accepting business of a desirable character at the figures herewith quoted, viz.: \$28 @ 28.50, delivered, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck-Bars.**—The market is bare of stock, so that prices are irregular and unsettled. Sales have been made at \$28.50, delivered, with a further demand at same price, but holders ask \$28.75 @ \$29. Probably \$27.50 @ \$28, at mill, might be accepted, although higher prices are confidently predicted.

**Bar-Iron.**—There is not the improvement in this department which the trade seemed to expect. The demand is better and prices are nominally higher, but the amount of business forthcoming at the advance is not important. At last week's prices some large orders could be had, but as the cost is considerably more than it was, manufacturers need some advance to let them out. The general feeling is that 1.85¢ base should be a minimum for first-class Bars, and those making such quality obtain that figure or let the business go elsewhere. Some outside mills accept 1.75¢, and still lower figures are mentioned for Western Iron, but in spite of the disparity in prices it is felt that the general tendency is toward improvement. Skelp Iron is inactive, but firm, at 1.75¢ for Grooved; Sheared at from 1.95 to 2¢. A much better demand is expected for Skelp Iron, as some large contracts for Pipe are under negotiation.

**Plate and Tank Material.**—The mills are very full of work, and large orders would be hard to place without causing a further advance in prices. There is a great deal of business to come on the market during the next 60 days, but as the most urgent requirements have been provided for there is a disposition on both sides to await developments before entering into further engagements. The feeling is very firm, nevertheless, and the chances seem to be ultimately in favor of higher rather than lower prices. Meanwhile quotations are about as follows (although some mills ask more, while others might shade a little, according to the condition of their order-books): 2¢ @ 2.2¢ for Ordinary Plates and Tank Plates; 2.10¢ @ 2.25¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.25¢; Fire-Box, 3.7¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.30¢; Shell, 2.5¢ @ 2.7¢; Flange, 2.4¢ @ 3¢; Fire-Box, 3.4¢ @ 4¢.

**Structural Material.**—There is very little change in this department. The mills have all the work they can handle for the present and all they care to take at current prices. The outlook for the summer months is unusually favorable, as there is a great deal of work that must be done promptly. Prices are firm but somewhat irregular, some asking an advance, others accepting last week's prices, viz.: Bridge Plate, 2.05¢ @ 2.15¢; Angles, 2.1¢ @ 2.2¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, 2.8¢ for Iron or Steel.

**Sheet Iron.**—The demand is of a very satisfactory character, coming as it does

from all classes of consumers. Mills have plenty of orders, and have no difficulty in obtaining full quoted rates for all they can deliver within a reasonable time. Prices for carload lots are about as follows:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 28.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 28.....	3½¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 %
Common, discount.....	.87½ %

**Steel Rails.**—Business is not active, but prices are very firm. Mills are fairly supplied with work for the next 60 days, and are not disposed to accept orders for later deliveries unless at about \$28 at mill. There is a good deal of inquiry, and it is expected that there will be a demand large enough to keep the mills fully employed at current rates or higher.

**Old Rails.**—There are so few Rails here, and so few wanted, that they are hardly worth quoting. Holders ask \$28 and upward for Philadelphia delivery, but consumers are quite indifferent unless they can get them at about that price delivered, and in most cases they get them on the terms named from roads in the interior, although \$28.50 @ \$24 has been paid for American Rails.

**Scrap-Iron.**—Good Scrap is scarce on the sea-board, but relatively in good supply in the interior. The result is a light business, but firm prices about as follows: \$20.50 @ \$21 for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$16.50 @ \$17.50; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought-Iron Pipe.**—The demand is very satisfactory and prices firmly maintained. Mills are full of work, and it is said that some important contracts are on the point of being closed. Discounts unchanged, as follows: Butt-Welded Black, 52½ %; Lap-Welded Black, 65 %; Butt-Welded Galvanized, 45 %; Lap-Welded Galvanized, 52½ %; Boiler Tubes, 60 %.

**Nails.**—The demand is improving and the general feeling as to prices is better, but low sellers can still be found. For first-class Nails \$1.90 is quoted for carload lots and \$2 from store, but some brands are available at pretty near to the old figures. A general advance, however, is not improbable, and in fact is rather confidently predicted by some well-informed parties.

Messrs. John L. Hogan & Co. have removed their offices to the Bullitt Building (second story), 135 to 141 South Fourth street.

The partnership heretofore existing between E. M. Valentine and Ogden Armstrong, under the firm name of Valentine & Armstrong, has been dissolved by mutual consent. The business will be continued as heretofore by E. M. Valentine & Co.

Mr. Samuel D. Hopkins, who had charge of the warehouse and store of the Reading Iron Works, in Philadelphia, has resigned that position and formed a partnership with Mr. Charles E. Small, under the firm name of Hopkins & Small. The firm will act as manufacturers' agents for the sale of Wrought-Iron Pipe and Boiler Tubes, Engineers' and Machinists' Supplies, &c., at No. 206 South Fifth street, Philadelphia.





## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave.,  
Pittsburgh, June 26, 1889.

There has been nothing especially important developed in the general Iron business during the past week. The mills are all in operation and many of them are working up to their full capacity, and the outlook is favorable. The most important event of the week in labor circles was the rejection by the men employed at the Homestead Steel Works of the new scale submitted by the firm, so that a strike appears inevitable. So far as known, none of the manufacturers have as yet signed the scale.

Freight rates on Iron and Steel from here eastward have been reduced about 3¢ per 100 lb. The new rates are elsewhere published.

**Pig-Iron.**—We have to record a more active and firmer market, and there are now but few, if any, sellers for future delivery at present prices. And even for immediate near-by delivery buyers are more numerous and sellers are indifferent about making additional sales, and the most of the furnaces in this district are pretty well sold up. We quote prices as follows:

No. 1 Gray Forge.....	\$13.80 @ \$14.00, cash
No. 2 Gray Forge.....	\$13.50 @ \$13.75, "
All-Ore Mill.....	14.50 @ 15.00, "
White and Mottled.....	13.00 @ 13.50, "
No. 1 Foundry.....	16.00 @ 16.25, "
No. 2 Foundry.....	15.00 @ 15.25, "
No. 3 Foundry.....	14.50 @ 14.75, "
No. 2 Charcoal Foundry....	21.00 @ 21.50, "
Cold Blast Charcoal.....	26.00 @ 26.80, "
Bessemer Iron.....	15.75 @ 16.00, "

In regard to Bessemer Iron, while but few sales were reported, the market is firmer. We now quote at \$15.75 @ \$16, cash, for immediate delivery, but furnacemen are demanding considerably more for future delivery.

**Muck-Bar.**—Is in better demand and firmer, and while we are advised of a sale of 2500 tons at \$26, cash, there are but few sellers now under \$26.50, cash, and it is doubtful whether contracts could be made for August delivery under \$27, cash, as the feeling generally obtains that Pig-Iron is likely to advance within the next few weeks.

**Spiegel.**—Is still quoted at \$30 to \$30.50, cash, for 20 % and Ferro-manganese at \$59.50 @ \$60, cash, for 80 %.

**Manufactured Iron.**—There is a fair business; mills generally are pretty well employed, but prices have not improved. Of course manufacturers want to keep their mills in operation and hold their trade, which many of them have realized is easier to lose than regain, but many claim that it is difficult to get a new dollar for an old one in the present condition of the market. We continue to quote good Iron upon a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2 % off for cash. Plate-Iron is quoted at 2.10¢ @ 2.15¢, and No. 24 Sheet at 2.70¢ @ 2.75¢. Skelp Iron, 1.60¢ @ 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared.

**Nails.**—The Western Nail Association having dissolved, there are no regular prices, and it is difficult to give reliable quotations in consequence. Manufacturers here continue to quote at \$1.80 @ \$1.90, 60 days, 2 % off for cash. Wire Nails are quoted at \$2.20 @ \$2.25, 60 days, 2 % off for cash; car lots can be bought at the inside quotation.

**Wrought-Iron Pipe.**—The activity noted for some time past continues, and the combination prices are being faithfully adhered to; it is said that never since the association was formed have prices been so honestly maintained as the present year. There has been entire absence of cutting ever since the reorganization of the association. Discounts on Black Butt-Welded Pipe, 52½ %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 52½ %; Casing, 5½ inches,

62½ % off; other sizes, 60 % off; Boiler Tubes, 1½ inches and smaller, 55 % off; 2 inches and larger, 60 % off; 2-inch Tubing, 13¢ per foot, net; Line-Pipe, 2-inch, 10½¢ per foot, 2½-inch, 16¢; 3-inch, 25¢; 4-inch, 30¢; 4½-inch, 36¢; 5-inch, 42¢; 6-inch, 58¢; 7-inch, 70¢; 8-inch, 95¢; 9-inch, \$1.20; 10-inch, \$1.25; 12-inch, \$1.60.

**Old Rails.**—Old Iron Rails are still quoted at \$22.25 @ \$22.50. Some of the brokers report that while the offerings are light, the demand is chiefly for small lots, indicating that consumers are not disposed to buy beyond immediate actual wants. Old Steel Rails are still quoted at \$16.50 @ \$17 for short and \$19 @ \$20 for long pieces.

**Steel Rails.**—Heavy sections are still quoted at \$26 @ \$27, cash, at mill, according to character of order and delivery. The market is firmer, with an increasing demand. It is said that some of the orders of the Cambria Company have been transferred to other mills, the former, owing to its disablement, not being able to fill the same according to contract. Both mills, the one at Braddock and the other at Duquesne, are running up to their full capacity.

**Blooms, Billets, &c.**—Sales of Bessemer-Steel Billets reported at \$26.75 @ \$27.25, and Bessemer-Steel Nail Slabs at \$26.50. There have been no sales of Bloom Ends or Rail Crops recently, in the absence of which it is difficult to give reliable quotations.

**Railway-Track Supplies.**—There is an improved demand, but no change in prices. Spikes, 1.95¢, 30 days, free on cars at works in Pittsburgh; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, \$2.75 with Square and \$2.85 with Hexagon Nuts.

**Old Material.**—There is more inquiry, and the market is firmer, but prices remain about as last quoted. Sales of No. 1 Wrought Scrap, \$18, net ton; No. 1 Wrought Turnings, \$13 @ \$14; Old Car-Axles, \$23 @ \$24.50; Cast Scrap, \$13.50 @ \$14, gross; Cast Borings, \$11.50 @ \$12, gross; Old Car-Wheels, nominally \$18; sale of Beam Ends at \$17.25, gross. The indications are that there will be a materially improved demand for everything in this line next month, and if so the market will stiffen.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,  
CHATTANOOGA, June 24, 1889.

**Pig-Iron.**—The indications for the past week have been very encouraging to producers, and the outlook for the future, so far as prices are concerned, is much improved. The inquiry has been more active and the endeavors to contract for round lots for monthly deliveries in the future have been more numerous than formerly. Quite a number of furnaces have withdrawn from the market and others are asking an advance of 50¢ per ton, and instances are not wanting when large orders have been declined at that. So far as can be ascertained there has been but very little accumulation of stocks in the yards of any of the furnaces; nearly all on hand has been held some time by furnaces that are able to hold against any financial pressure. Large consumers are, as a general thing, confining themselves to grades and makes that they have been using in the past and with which they appear to be satisfied, and with good customers the furnaces are dealing liberally, so far as prices are concerned. Some three or four of the large Pipe-makers took in the situation and have contracted within the past month for large round lots of Pipe Iron, aggregating probably some 50,000 tons, which will put them out of the market for a while; but the increased

demand that has come forward from other sources would more than cover the capacity of the furnaces even if all were willing to sell.

The freight rates on Pig Iron from Birmingham have been decreased to \$3.65 to Chicago, Pullman, Grand Crossing and Hegewisch, formerly \$4.

The Attalla Furnace, recently blown in so successfully at Attalla, Ala., is now about up to her capacity. The Ore that is being used is from what is known as the Dirt Seller Vein, with some little Brown Hematite. This Ore is called the Red Fossil, and the vein runs from 3½ to 5 feet, continuing through the Coosa Valley with very little variation. It was partially from this Ore that the Confederate Government made their celebrated Brooks guns at Selma. Some two or three small furnaces were formerly run on this ore, and the product was made into Car-Wheels, which gained a wide celebrity through the South.

## Detroit.

WILLIAM F. JARVIS & Co., under date of June 24, 1889, says: There has been a large amount of buying during the past week, and the Lake Superior Charcoal trade has been very active. Several large buyers have made their purchases for from six months to a year's delivery, and there are several buyers willing to contract if they can secure long deliveries at present price, or even at a slight advance. The demand for Coke Irons has also been better than for some time past, but Silvery Irons are most called for, and some large sales have been made at low figures. We cannot report any advance, but furnaces are refusing orders for long deliveries at present quotations, unless in special cases. We report an active market and quote as follows:

Lake Superior Charcoal, all numbers.....	\$19.00 @ \$19.50
Lake Superior Coke, all ore.....	18.00 @ 18.50
Lake Superior Coke, cinder mixed.....	17.50 @ 18.00
Standard Ohio Black Band.....	17.50 @ 18.50
Southern No. 1.....	18.50 @ 17.00
Southern Gray Forge.....	15.00 @ 15.50
Southern Silvery.....	18.00 @ 18.50
Jackson County (Ohio) Silvery..	18.00 @ 18.50
Old Wheels.....	18.50 @ 19.00

## New York.

Office of *The Iron Age*, 66 and 68 Duane street,  
New York, June 26, 1889.

**Pig-Iron.**—The tone of the market continues firm, the advanced rates recently made on special brands being sustained. Buyers now realize that they no longer control the situation and are inquiring prices in directions which they had for some time neglected. The Thomas Iron Company, who are still the largest makers of Foundry Iron in the country, report that they will have no more Iron to sell this year except to their own recognized customers. Their output is now 3600 tons per week, which is being shipped as rapidly as it is produced. The condition of this company well represents the change which has come over the Iron trade. At this time last year they had a stock of 12,000 tons of Nos. 1 and 2 Foundry, but they now have only 1200 tons on hand, all of which will be shipped to customers before the 1st of July, thus leaving them with no stock. In almost equally good condition is the Tennessee Coal, Iron and Railroad Company, represented in this market by Naylor & Co. Their capacity is well sold up for months ahead and they are making large shipments. While ready to take small orders, they are not forcing the market, but can afford to await developments. These are representative concerns, North and South, and their condition shows very plainly the satis-

factory shape into which the Iron trade has gradually worked. The advance of 50¢ by the Thomas Iron Company goes into effect next Monday, but does not apply to their regular customers. The demand for Iron was quite good during the week, but the volume of business was not as large as in the preceding week. Quotations are as follows: Northern Irons at tidewater, \$16.50 @ \$18 for No. 1, according to brand; \$15.50 @ \$17 for No. 2; \$14.50 @ \$15.25 for Gray Forge. Southern brands sell at \$16.25 @ \$17 for No. 1; \$15.50 @ \$16 for No. 2; \$14.75 @ \$15 for No. 3; \$4.25 @ \$14.50 for Gray Forge, all delivered at New York.

**Scotch Pig.**—Consumers are still ordering for future delivery, but the entire quantity of Iron sold on this account will not reach very large figures. Stetson & Co. have cable advices from abroad that prices are slowly advancing, but quotations here are not affected, being as follows: Eglinton, \$19; Dalmellington, \$19.50; Langloan, \$21.25; Summerlee, \$21.50; Coltness, \$21.50.

**Spiegeleisen.**—Twenty per cent. is quoted at \$28 @ \$28.50, and 80 % Ferro at \$59 @ \$60, with very small transactions.

**Wire Rods.**—The quotation ex-ship is still \$43, with no sales.

**Structural Iron and Steel.**—A very satisfactory business is in progress, but the demand is not so heavy as it was during the previous week. Buyers are realizing that there is not any danger just at present of a decided scarcity of material. Still, quotations are firmly held at the higher rates recently made, and it seems likely that they can be maintained. Prices are about as follows for delivery on dock: Sheared Plates, 2.05¢ @ 2.1¢; Universal Mill Plates, 2.1¢ @ 2.15¢; Angles, 2.05¢ @ 2.1¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢.

**Plates.**—The mills represented in this market are very full of work, and it is somewhat difficult to place orders with those whose products have the highest reputation. For delivery on dock quotations are as follows: Tank Iron, 2.05¢ @ 2.1¢; Shell, 2.4¢ @ 2.5¢; Steel Tank, 2.25¢ @ 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.7¢ @ 2.8¢; Fire-box, 3.25¢ @ 4¢.

**Bar-Iron.**—Work is fairly abundant, with prices for dock delivery as follows: Common, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.75¢ @ 1.9¢.

**Merchant Steel.**—The week has been very quiet in this line, with quotations unchanged, as follows: Tool Steel, good brands, in large lots, 7¢ @ 7½¢; specials, 12½¢ @ 20¢; Crucible Spring, 8½¢ @ 4¢; good Open-Hearth Machinery, 2.30¢ @ 2.5¢; common ditto, 2¢ @ 2.25¢; Open-Hearth Spring, 2½¢ @ 2.5¢; Sheet, 6½¢, 8½¢ and 10½¢.

**Steel Rails.**—Inquiries are still coming forward but not for large quantities, except in the case of railroad projects involving some financing as a preliminary to business. The sales of the past week have therefore amounted to but a few thousand tons. The manufacturers, however, appear to be well supplied with orders for some time to come and are disposed to let matters shape themselves. They quote on small lots, such as are now being placed, \$28 @ \$28.25, at mill.

**Track Supplies.**—A fair volume of business is reported, but in Fish-Plates there is an unsettled feeling caused by the competition for orders on the part of mills making Steel. The usual quotations are 1.85¢ @ 2¢ at mill, but Steel Fish-Plates can be purchased at perhaps ½¢ lower. Track Bolts, with Square Nuts, are firm at 2.70¢ @ 2.75¢; Hexagon Nuts, 2.90¢, of Common Iron, and 3¢, Refined Iron.

Spikes are quoted at 2¢, with an upward tendency.

**Old Material.**—Old Iron Rails are in good request. A sale of 800 tons is reported at \$22, on cars, New York, equivalent to \$22.50 on the other side of the North River. Consumers are offering \$22.50 @ \$22.75, but are unable to secure Rails held here in store, for which \$24 is asked. Old Steel Fish-Plates have been sold at \$22, on cars, New York; Iron Fish-Plates at \$23, also on cars, New York. Wrought Scrap is firmer, with more business doing, and is now quoted at \$21 for No. 1 of good quality.

## Financial.

There was much speculative activity during the past week, "industrial stocks" having become more than ever a special feature, the aggregate transactions in these latter on 'Change being considerably in excess of the total of all other descriptions. Oil trading also became exciting after a long period of inertia. Wheat, corn and oats advanced a little, with a moderate inquiry from shippers, chiefly for Europe, though partly for South America, but scarcity of freight room checked European business. Spot corn at the close was easier. Hog products steadily tend to lower prices. The break in coffee is still felt in the market. In dry goods there is a firm tone, so that opportunities for buyers are less favorable than a month ago. A pleasing feature is the good harvest reports. In California wheat is being gathered all over the State with the best results. A St. Paul dispatch says: "Conservative estimates made on 'Change place the wheat crop for Minnesota and Dakota at from 70,000,000 to 100,000,000 bushels." The wheat harvest is in progress as far north as central portions of Ohio, Indiana and Illinois. The Illinois State Board estimate the crop at 26,670,000 bushels. In Kansas the crop is gathered and President Cable, of the Rock Island, says the yield is a good one. The report of damage is contradicted. The business situation as a whole is generally construed as favorable, despite the export of gold and speculative tendencies, though the continued agitation respecting costs of transportation operates as a drawback. There is a belief, however, that rates will be maintained in prospect of heavy traffic in wool, grain, &c. Flying rumors in regard to trusts in coal, rubber, castor oil, plug tobacco and other descriptions of merchandise have not materialized. The decision of Judge Rightor, of New Orleans, making permanent the writ of injunction issued previously against the Cotton-Seed Oil Trust, forbidding the trust to exercise any privileges or franchises in the State of Louisiana, and declaring it to be an illegal and invalid association, is in harmony with Judge Barrett's Sugar-Trust decision in this city.

The Stock Exchange markets were active, with sales of trust stocks the leading feature, notably Sugar Refineries, Cotton Oil and Lead trusts. The buying of Sugar Trust was accompanied by a rumor of an extra dividend to be paid out of the enormous surplus which the trust claims to have in its treasury. On Monday transactions were enormous. The advance in Lead Trust was said to have been caused by a report that the Atlantic Lead Company, of Brooklyn, had been absorbed, and the rise in Pipe Line certificates was represented to be due to an increased export demand for oil. The boom in petroleum was not less marked, sales aggregating 5,000,000 barrels and prices touching 89¢. American cotton-oil certificates were sold on Judge Rightor's decision enjoining the trust from doing business in the State of Louisiana, but the price declined only ¼, to 58, and rallied to 58½. On Tuesday

Sugar Trusts fluctuated widely and lost all Monday's advance, closing at 117½. Lead certificates were again lively with large transactions, but conservative investors fight shy. Railway shares received more attention, and were well sustained. The Standard Oil is credited with having inspired the entire deal.

United States bonds are quoted as follows:

U. S. 4½%, 1891, registered.....	108½
U. S. 4½%, 1891, coupon.....	108½
U. S. 4%, 1907, registered.....	128½
U. S. 4%, 1907, coupon.....	129½
U. S. currency 6s.....	118

The money market was a shade firmer, owing to the reluctance of capitalists to accept Trust certificates as collateral for loans on as favorable terms as railway shares. Time money on first-class collateral is quoted at 3 % for 90 days; 3½ % @ 4 % to end of the year. The supply of commercial paper is better, and is quoted 60 to 90 days at 3½ % @ 4½ %; good single names, four to six months, 4½ % @ 5½ %.

The weekly statement of the Associated Banks shows a loss in surplus reserve of \$1,882,725, which reduces the amount held above legal requirements to \$9,220,500. The exports of nearly \$6,000,000 gold and the absorption of money by the Treasury operated against the banks. The gain from the interior currency movement was less than usual. The loss in specie and legal tenders combined was \$1,496,500. Loans were increased \$615,600 and deposits decreased \$455,100. According to the custom-house report the exports of specie from New York for the week were \$5,894,839, making a total since January 1 of \$47,679,659, which is the largest amount recorded for the same period within the last decade. Director of the Mint Kimball, when questioned with regard to gold exports, said that they were caused by demands from France. "About the 1st of June," said the director, "the Bank of England raised by half a penny an ounce the price at which it would sell French gold coins, and recourse has been had to the United States." Another explanation is that shipments of gold result from sales of securities on French account by those who have suffered in copper speculations. Again, foreign capitalists are dissatisfied with the present aspect of the silver question. The commercial and crop situation indicate that the flow of gold will soon be in the opposite direction.

The total clearings of 37 cities last week show an increase of 30.6 %. New York gained 11.2 %; Boston, 37.7 %; Philadelphia, 11.4 %; St. Louis, 30 %; San Francisco, 25 %; Cincinnati, 20.7 %; Louisville, 36.9 %; New Orleans, 21.6 %; Omaha, 32.4 %; Denver 29.7 %; Cleveland, 27.2 %; Indianapolis, 20.2 %.

The importations of merchandise at this port during the week were valued at \$9,908,000. Since January 1 the total is \$242,958,000, as compared with \$231,142,000 for the same time last year. The exports were \$4,950,000.

The Bureau of Statistics statement of imports and exports for May, just issued, shows a considerable increase in the value of both exports and imports over May, 1888. Exports of merchandise during the past month aggregated in value \$52,169,197, against \$47,087,190 in May, 1888; while imports of merchandise in May past were valued at \$68,754,994, against \$60,482,698 in May a year ago.

The total merchandise and coin and bullion exports during May aggregated \$70,103,756, while imports amounted to \$71,415,617, an excess of imports over exports amounting to \$1,311,861. For the 11 months of the current fiscal year exports of merchandise, coin and bullion aggregated in value \$769,412,975, an excess of \$58,597,509 over imports for the same period.

## Metal Market.

**Copper.**—The London market declined on spot Copper from £41. 10/ last Wednesday to £41. 2/8 yesterday, and futures from £41. 5/ to £40. 15/, with sales of 900 tons. Pending the renewal of a pool sale by the Lake companies to our manufacturers, to date from the 1st prox., the price to large consumers has remained 12¢. There is a diversity of opinion as to whether or not this figure will be fixed for the next contract. Some consumers think it may be reduced, while others are inclined to believe there will be no change, as consumption seems to readily absorb Lake Copper at 12¢. It has been jobbing at 12½¢ @ 12½¢, and casting brands have moved off at 10½¢ @ 11½¢, as to brand. During the first quarter of this year Spain exported 928,667 tons of Pyrites, against 270,754 in 1888 and 266,679 in 1887; of Precipitate the shipments were 8781 tons, against 10,164 and 9823.

**Tin.**—London gave way since our last report from £89. 10/, spot, to £88 last night, and futures from £90. 2/6 to £88. 15/. Sales were 800 tons. As we have followed suit, consumers have taken hold more readily, buying in the open market at 19.95¢ @ 20¢ some 200 tons, but with the drooping tendency subsequently accelerated, September and October were done on 'Change at 19.80¢, July at 19.70¢ and September at 19.85¢, the spot price winding up at 19½¢ @ 19½¢. At the Metal Exchange on the first call 10 tons July brought 19.85¢, and 10 tons October 20¢. **Tin-Plates.**—Only a moderate business having been done, prices remain without material change; the make continues excessive, and stocks accumulate on the other side, where prices are weak in consequence. The export of Tin-Plates from England to the United States during the past five months has been 150,232 tons, as compared with 117,254 tons same time last year and 109,943 in 1887; to all quarters, America included, it was 187,786 tons, against 153,781 and 145,072. We quote large lines, ordinary brands, ½ box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.55 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.22½ @ \$4.32½, and Wasters \$4.12½ @ \$4.15.

**Lead.**—Sales in the open market were restricted to 400 tons of Common Domestic at 4¢, the market being quiet and closing at this figure, while at St. Louis it has been strong at 3.80¢, and at Chicago at 3.85¢. Nothing has as yet been decided in Washington about the Ore question, the impression in this city being that a duty will be imposed; still, there is nothing positive to base this belief on, the contending interests being equally powerful. Spanish exportation of Pig Lead during the first quarter has been 42,105 tons, against 44,460 tons during the corresponding period of last year and 42,972 in 1887. At the Metal Exchange on first call 50 tons August Lead were sold at 4.05¢, closing at 4¢ bid and 4.07½¢ asked.

**Spelter.**—The floods out West have caused a rise in Ores there of \$1 to \$2 ½ ton, so that Common Domestic cannot be sold for less than 5¢ @ 5.05¢ in this city, at which it remains moderately active, while Silesian, with the rise in London, is held at 5.85¢ @ 5.90¢. Spanish Calamine exportation during the first quarter has been 6773 tons, against 8518 last year and 8287 in 1887.

**Antimony.**—Has been strong, with an active demand, at 15½¢ @ 16¢ Cookson's, and 14¢ @ 14½¢ Hallett's.

### New York Metal Exchange.

The following sales are reported:

FRIDAY, June 21.	
50 tons Lead, spot.....	3.97½¢
16 tons Lead, August.....	4.02½¢
10 tons Tin, August.....	20.10¢

10 tons Tin, spot.....	19.95¢
15 tons Tin, spot.....	20.00¢
10 tons Tin, October.....	20.00¢

### MONDAY, June 24.

10 tons Tin, September.....	19.80¢
10 tons Tin, October.....	19.80¢
50 tons Lead, spot.....	4.00¢

### TUESDAY, June 25.

16 tons Lead, September.....	4.10¢
20 tons Tin, July.....	19.70¢
10 tons Tin, September.....	19.85¢
22 tons Lead, August.....	4.07½¢

### WEDNESDAY, June 26.

50 tons Lead, August.....	4.05¢
10 tons Tin, July.....	19.85¢
10 tons Tin, October.....	20.00¢
30 tons Tin, July.....	19.95¢

### Old Metals.

The following are the prices paid for Old Metals in New York:

Heavy Copper.....	\$ 10 9¢
Light Copper.....	\$ 10 8¢
Heavy Brass.....	\$ 10 7¢
Light Brass.....	\$ 10 6¢
Lead.....	\$ 10 3¢
Tea Lead.....	\$ 10 2½¢
Zinc.....	\$ 10 2½¢
No. 1 Pewter.....	\$ 10 14¢
No. 2 Pewter.....	\$ 10 7¢
Wrought Scrap Iron.....	\$ gross ton, \$17.00
Heavy Cast Scrap.....	\$ gross ton, 12.00
Stove Plate Scrap.....	\$ gross ton, 8.00
Burnt Iron.....	\$ gross ton, 6.00

## Coal Market.

The Hard-Coal trade is dull and weak, supplies from the mines being in excess of requirements, while the demand is of the character usual at this season. A report comes from Philadelphia that it is generally believed that no advance in prices can be secured in the schedule for July, "though an attempt to that end will be made." It is natural to reason that agitation on this subject would at least have a bracing effect, but it is remarked that "the raising of prices ahead of the market does not work as well this year as it did last." Producers are confident of an active period near at hand, although just now sales are heard of as low as \$4 ½ ton for Stove and \$3.75 for Chestnut, alongside. The reported total production last week is 807,600 tons, as compared with 580,000 tons a fortnight ago, and since January 1 the figures are 14,323,000—a decrease of 1,315,000 tons compared with the same time in 1888. The Reading Company contributed during the week 142,000 tons, indicating a rapid recovery from their loss by the flood. Anthracite has been helped by the cutting off of supplies of Bituminous Coal via the Beech Creek route and other heavy feeders. Further relief will come from the reopening of communication with the West about the beginning of July. From an official of one of the Anthracite Coal roads it is learned that the production in May was 3,016,581 tons, against 2,851,470 tons in May of last year. The stock at tide-water June 1 was 962,066 tons, against 964,628 tons on June 1, 1888. For five months the output is as follows:

Region.	1889.	1888	Difference.
Wyoming.....	6,307,812	8,541,891	Dec. 2,184,079
Lehigh.....	2,280,628	1,890,580	Inc. 969,048
Schuylkill.....	3,496,544	3,906,384	Inc. 161,169
Total.....	12,113,986	13,177,906	Dec. 1,063,821

Bituminous Coal is in full supply and prices are cut. Cumberland shipped for the week ending June 15 60,850 tons and since January 1 1,319,792 tons. On the Pennsylvania Railroad cars are scarce both for Bituminous and Anthracite, on account of the demands in transporting road-bed material for repairs. Grievous complaints are heard from the iron establishments in Eastern Pennsylvania, many of which were threatened with an immediate shut-down on account of the scarcity of fuel, as the Schuylkill Valley is largely supplied from Beech Creek and Clearfield.

At Pottstown the Ellis & Lessig Steel and Iron Company, Cofrode & Saylor's extensive bridge works and the Pottstown Iron Company were nearly out of fuel. At Conshohocken the Jawood Lukens rolling-mill and the Woods mill were nearly exhausted. In most cases there has been timely relief.

A serious strike may follow a failure to settle differences between Clearfield miners and the coal operators about pay for "dead work."

## Imports.

### Hardware, Machinery, &c.

Almgoist, A. W., Mach'y, cs., 25  
Baker, Hermann & Co., Mdse., cs., 7; Arms, cs., 33  
Brubacher, D., Mach'y, box, 1  
Carnegie, Phippe & Co., Mach'y, pos., 49  
Cohn Bros., Hardware, cs., 3  
Folsom Arms Co., H. & D., Arms, cs., 25  
Field, Alfred & Co., Arms, cs., 36; Mdse., pkgs., 5  
Godfrey, Chas. J., Arms, cs., 6  
Graef Cutlery Co., Cutlery, cs., 10; Hardware, cs., 1  
Hartley & Graham, Arms, cs., 13  
James Emile, Sewing Machines, cs., 22  
Korting Gas Engine Co., Mdse., cs., 3  
Lau, J. H. & Co., Arms, cs., 15  
Merch. Deep. Co., Arms, cs., 10  
Pearsall, H. D., Mach'y, cs., 12  
Speisburg, E. G., Mach'y, cs., 1  
Schoverling, Daly & Gales, Arms, cs., 4  
Tryon, E. K. & Co., Arms, cs., 8  
Winter & Smille, Files, cs., 7  
Witte, John G. & Bro., Cutlery, cs., 4  
Wiebusch & Hilger, Lim., Mdse., cs., 23; Chains, cs., 18  
Order: Nails, cs., 20; Mach'y, box, 1; ditto, pkgs., 5; Hdw., cs., 18

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 26, 1889.

The trade demand for named brands and Merchant-Bar Copper has been quite large, but it is believed that large holders continue to realize, and prices for Merchant Copper are therefore somewhat irregular, with sales of prompts at £41 the past few days. Few traces are noticeable of demand from French consumers. Nothing new transpires regarding the proposed agreement between producers.

Block Tin has continued to decline under the weight of free selling caused by full supplies from the Straits and comparatively little business. Sales were made at £88 for prompts, but from that price there was a reaction to £88. 10/ late Tuesday and a further 2/6 @ 5/ rise to-day.

Speculation in Pig-Iron warrants has been moderate owing to absence of outside interest in the market and prices are hardly steady. Stocks have been reduced owing to the damping-down of three furnaces on account of disputes with workmen and higher prices for Ores and Coal. A further reduction in the output from the same causes is likely. The demand for makers' brands of Scotch has been rather slow, but Middlesborough is more active and there continues to be a fairly active trade in Hematites.

The Tin-Plate market is in a dragging condition at present and sellers are less pressing with buyers in the matter of prices. No change of importance is quoted.

Bolckow, Vaughan & Co. have booked a large order for Steel Rails for India, and German makers have secured a large one for Australia. The market is quite lively, and a brisk trade is reported also in Billets and Blooms.

The Belgian Iron syndicate agreement has been renewed.

Consumers have been buying old material less freely, but firm prices are maintained by holders.

**Scotch Pig.**—The volume of business is moderate and prices are without material alteration.

No. 1 Coltness, f.o.b. Glasgow	54/6
No. 1 Summerlee, " "	53/6
No. 1 Gartsherrie, " "	51/6
No. 1 Langloan, " "	53/6
No. 1 Carnbroe, " "	49/6
No. 1 Shotts, " at Leith	52/
No. 1 Glengarnock, " Ardrossan	51/6
No. 1 Dalmeilington, " "	45/
No. 1 Eglinton, " "	43/
Steamer freights, Glasgow to New York, 2/;	
Liverpool to New York, 10/.	

**Cleveland Pig.**—More doing in this line and the market firmer. No. 3 Middlesborough quoted 38/6 @ 39/ prompt.

**Bessemer Pig.**—There is a fairly active business at steady prices. West Coast brands, mixed numbers, 49/6, f.o.b. shipping point.

**Spiegel Eisen.**—The movement has continued free and prices are steady. English 20 % quoted 80/, f.o.b. at N. W. England shipping point.

**Steel Rails.**—A large business done at about last week's prices. Heavy sections quoted at £4. 10/, and light sections £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—There has been a fairly active demand and the market is firm. We quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Sales have been large and the market is strong. Bessemer, 2½ x 2½ inch, £4. 12/6, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Business moderate, but prices held firmly. Bessemer, £4. 12/6, f.o.b. at N. W. England shipping point.

**Old Rails.**—The demand fair and sellers firm. Tees quoted at £3. 5/ @ £3. 7/6, and Double Heads, £3. 12/6 @ £3. 15/, c.i.f., New York.

**Scrap-Iron.**—A fair business, with prices very steady. Heavy Wrought quoted at £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—The movement is fair and prices steady. Bessemer quoted £2. 12/6 @ £2. 15/, f.o.b.

**Tin-Plate.**—Business moderate and prices hardly steady. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	12/6 @ 12/8
IC Siemens	13/9 @ 13/10
IC Coke, B. V. grade	12/ @ 12/6
Charcoal Terne, Dean grade	12/ @ 12/3

**Manufactured Iron.**—There has been more activity in this branch, at generally firm prices. We quote, f.o.b. Liverpool:

Staff, Marked Bars	£ s. d. @ 8 2 6
Common	6 2 6 @ 6 5 0
Staff, Bl'k Sheet, singles	7 15 0 @ 7 17 6
Welsh Bars (f.o.b. Wales)	5 12 6 @ 5 15 0

**Copper.**—A fairly active business, with prices rather lower on Merchant-Bars. Today's prices for Bars were £41. spot; £40. 12/6 @ £40. 15/, three months' futures. Best Selected, £47.

**Tin.**—Quite active trading on the decline. Straits quoted to-day at £88. 10/ @ £88. 15/, spot, and £89. 5/ @ £89. 10/ for three months' futures.

**Lead.**—The market remains very quiet, with prices easy. Quoted £12. 7/6 for Soft Spanish.

**Spelter.**—There has been a large business and the market is stronger. Quoted at £19. 10/ for ordinary Silesian.

## Foreign Markets.

### EQUIVALENTS.

Franc, Peseta or Lira	Cents.
Florin (Netherlands)	10.8
Florin (Austria)	36.9
Witels (Portugal)	11.08
Witels (Brasil)	54.6
Mark (Germany)	33.8
Kilogram	Pounds
Picul	2.205
	184.

### EAST INDIES.

**COLOMBO, CEYLON, May 16, 1889.**—*Plumbago.*—Prices are firmly sustained, with a good business doing. We quote at the close in rupees: ton: Large lumps, 145 @ 170; ordinary lumps, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Following have been the shipments to date since October 1: To England, 95,788 cwt.; to Hamburg, 6206; to Antwerp, 6299; to Bremen, 1060; to Holland, 437; to India, 139; to Australia, 287, and to the United States, 85,951; together, 200,167, against last year 164,003, 184,020 in 1887 and 110,171 in 1886. The market for Coir Yarn is steady and unaltered at 7 @ 13 rupees per cwt., Nos. 1 to 4. *Exchange.*—Six months' sight on London, 1/4%. *Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street.*

**SINGAPORE, May 9, 1889.**—*Tin.*—Following currency of London prices, our market has given way to \$34.37½ per picul, at which there are sellers, but no buyers. Stocks are not large, nor are large supplies expected to arrive in the near future, so that any further decline there may be must take its origin in the consuming markets. The April shipments were: 422 piculs per steamer Kaiser-i-Hind, from Penang; 590 per Prometheus, 253 per Kasgar and 1683 per Preussen, hence all for New York; 169 per Monmiur, hence to San Francisco, and 1682 per Nizam to New York. Total shipments to the end of April from the Straits, 43,894 piculs. *Cum Copal.*—Moderate arrivals have commanded full prices for good quality. *Gum Damar.*—There have been no arrivals. *Tonnage.*—Steamer rates for London are firmer, both for this and next month's shipment, at 40/ for dead-weight, with very little room offering by the regular lines. *New York via Cape.*—The Elise, due in a few days, will occupy this berth, having secured a full complement of dead-weight. For Boston the berth is vacant at the moment. *Exchange.*—Very firm indeed at 3/1½ for six months' sight credit drafts. *Gilfillan, Wood & Co*

**MANILA, June 17, 1889.**—*Hemp.*—The quotation is nominally \$15 per picul, as compared with \$8 same date last year, equaling per ton, cost and freight, £48/5, against £27. 7/6. The clearances for the United States since January 1 amount to 118,000 bales, as against 83,000 last year; loading for do., 13,000, against 17,000; cleared for England since January 1, 120,000, against 150,000; loading for do., 8000, against 30,000; cleared for all other ports, 22,000, against 38,000; receipts at all ports since last cable, 21,000, against 10,000; since January 1, 288,000 bales, against 283,000 in 1888 and 219,000 in 1887. *Freight.*—\$7.50, against \$5.50. *Exchange.*—Six months' sight, 3/5½, against 3/5¼. *Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

### SPAIN.

**BILBAO, June 1, 1889.**—*Iron Ore.*—An active demand has prevailed during the week; several contracts have been made, some being quite important. Most of the Rubios sold went at 7/ @ 7/3, some bringing as much as 7/6. Campanil being scarce it has not been easy to get any at 8/4 @ 8/6; Superior Campanil, 8/9 has been offered for in vain. A few cargoes of Vena brought 8/3 @ 8/6. Ore freights continue tending downward. Only 67,858 tons were shipped during the week. Total Ore export since January 1, 1,692,103 tons, against 1,598,585 in 1888. *Pig-Iron.*—While 2133 tons were exported during the week, 952 went coastwise. *Bilbao Marítimo y Comercial.*

### BELGIUM.

**BRUSSELS, June 15, 1889.**—*Iron.*—Consumers are not very anxious to subscribe to the advance of 2.50 francs per ton in Merchant Iron agreed upon at the late general meeting of Iron-masters. The quotation for sale at home is at present, for Nos. 1 to 3, 12.75 @ 14.75 francs per 100 kg., and free on board at Antwerp, 12.25 @ 13.75; Angles respectively, 13.75 and 13.25; ditto for vessels, 14.50. Makers of Beams not being members of the syndicate, they have not raised them. On June 1 32 blast-furnaces were in operation in Belgium and 18 blown out. The May product has been 51,685 tons, of which 54,715 Forge Pig; 4185 Foundry ditto, and 22,785 Steel. Steel-Rail orders from South America have been refused, our mills being engaged for months ahead, and they have gone to France. *Moniteur des Intérêts Matériels.*

### GERMANY.

**HAMBURG, June 15, 1889.**—*Iron.*—The Iron trade of Rhenish-Westphalia has pretty much returned to a normal condition. In the Siegen district, while the strikes lasted, the blast-furnaces, with a reduced output, had nevertheless been kept going, and a good demand is now setting in for their product. Although Spiegel has been a little less sought for, it remains firm at 66 marks for 10 @ 12 % Manganese. White Luxembourg Pig improved to 36 @ 38 marks; Gray remains 40 @ 42. Finished Iron has kept uninterruptedly active; Hoop Iron in particular has been in lively request at advancing figures. All other rolling mill products have remained steady, but unaltered. Machine-shops, foundries and car-works have continued doing well. They quote Wire-Rods 110 @ 120; Steel Rails, 125 @ 130; last sale at 127; ditto for mines, 110 @ 115. *Metals.*—Have been looking up, Copper in particular, the general inquiry being brisk for all of them. We quote in this city: German Lead, 13 @ 13.30 marks per 50 kg.; Lake Copper, 64 @ 67; Spelter, 18 @ 18.50; Zinc, White, 21 @ 22, and Zinc, Gray, 20 @ 22. *Borsenhalle.*

We have received from James Butterworth Randol, of San Francisco, the following statement relative to the trade in quicksilver: "The receipts of quicksilver at San Francisco for May and the first five months of the year were as follows:

	For May.	Jan. 1 to May 31.
	Flasks.	Flasks.
1887	2,017	9,955
1888	2,584	15,021
1889	931	6,000

The product this year to date, as indicated by the receipts, is only about 36 per cent. of last year and 46 per cent. of 1887. It is probably owing to the diminished yield that the price rose from \$40.50 per flask at the beginning of May to \$47.50 at the close of that month. The exports by sea from San Francisco last month were the lightest in a long time, consisting of only 76 flasks, including 63 to Mexico, 10 to New Zealand and 3 to British Columbia. The exports for the five months ending May 31, 1889, were as follows:

	Flasks.	Value.
New York	430	\$18,000
Australia	10	425
New Zealand	15	608
Central America	1	41
Mexico	2,012	83,791
British Columbia	10	421
Totals	2,478	\$108,286
In 1888	6,832	273,776

Last year New York took 2020 flasks, Hong-Kong 1010 flasks, Mexico 3388 flasks and Central America 240 flasks. China has drawn all its quicksilver from London this year. Mexico must also be using more foreign quicksilver this year."

Michael P. Grace, of New York, has contracted conditionally with the President of Peru for the repair of the damages on the Oroya Railway occasioned by recent inundations. During 90 years he is to pay to the Government as an annual rental 60,000 soles in silver until the receipts of the line do not exceed 1 per cent. on a nominal capital of £1,500,000. Mr. Grace is obliged to purchase from the Government all the rolling stock now in use on the line for 499,000 soles silver, and he will retain of this 100,000 soles for the payment of the building used as the Desamparados depot in Lima and 88,000 soles to pay off certain claims against the railway for the ground occupied, &c.

A fire in Johnstown on Monday originated from carelessness in burning debris, and 25 houses were destroyed, together with household effects. Previously a woolen factory was destroyed in like manner.

The losses of property by the recent floods in Pennsylvania are estimated by *Bradstreet's* at \$44,250,000.



## Hardware.

With the close of the month and the ending of the half-year there is a falling off in business, which, however, continues fair in a small way. Buyers are naturally holding off until next month and orders are mostly for goods to meet immediate wants or for seasonable specialties, which are in average demand. There is, however, some movement in Southern business and a good many buyers from that section are in town. Prices are without material change, but in some directions there are indications of a better tone.

### Cut Nails.

The effects of the flood in Central Pennsylvania are still being felt in the scarcity of Nails here and in the irregularity in shipments on old contracts. Prices remain about the same as previously reported, although the action of the Philadelphia Nail houses in putting prices up to \$1.90 for carloads and \$2 from store is having an effect on sellers here. The Oxford Iron and Nail Company had anticipated this action, but the others have not yet followed the lead thus established. The market is very sensitive, however, and dealers are insisting on knowing specifications before quoting prices. If everything is favorable they will sell at \$1.80 to \$1.90, but they are watching matters very closely, to be ready to take advantage of any decided change that may favor better prices. Parties who have tested many leading manufacturers both East and West during the past week with orders for considerable quantities of Nails report that a large number of them state that they have all the orders they care to fill for the present; others reply that they have shut down or intend to do so, and very few make quotations. Those who quote the prices ruling of late insist on an average ranging from 25 cents above the base price upward. Buyers willing to make out a specification running from 50 to 75 cents above base can secure favorable terms, but others cannot.

### Miscellaneous Prices.

With a view to preventing the massing of orders by several concerns, some of the manufacturers who are attempting to control prices by combination have adopted a rule prohibiting any of their number from shipping goods to other houses than the one by whom they are ordered. Under this restriction it will be seen that in case the goods finally reach different concerns, it will be at the expense of reshipment.

The Improved Eureka Fruit-Pitter, manufactured by Farnsworth & Co., San Francisco, Cal., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, a description of which is given on page 981, is sold at \$5 each, subject to a discount of 25 per cent. Furnished with both cushions, the list price is \$6.

The following is the discount sheet of the company showing the different goods covered by their catalogue and the prices. Terms, net 30 days or 2 per cent. discount for cash in ten days:

	Discount.
Rapid Vises and Attachments.....	25 %
Giant Vises.....	30 %
Giant Vise and Drill Combined.....	35 %
Eureka Vise.....	50 %
Steam Fitters' Vise.....	30 %
Never-Slip Combination Pipe and Bench Vise.....	25 %
All-Steel Open-Pipe Vise.....	25 %

Both Cast and Wrought Butts continue low, the market being considerably demoralized. Some Western jobbers are offering them at cut prices, which in some cases approximate more nearly than they should the manufacturers' quotations.

The condition of the Sand-paper market is such that it will be worth the while of buyers to look into it carefully before placing considerable orders. It is not unlikely that some retailers purchasing even fair quantities will be able to obtain advantageous figures after careful inquiry.

The condition in the market on Wringers has not in its material features greatly changed, but some prices, even lower than those generally prevailing, are made by some of the prominent jobbing houses, especially in the West.

The prices of Shot were to-day advanced to the following figures, subject to a discount of 2 cents per bag, 25 pounds, for cash within five days from receipt of bill:

Drop, per bag, 25 pounds.....	\$1.25
Drop, per bag, 5 pounds.....	.50
Buck and Chilled, per bag, 25 pounds....	1.50
Buck and Chilled, per bag, 5 pounds.....	.35

There has been for some time some irregularity in the Coffee-Mill market, owing especially to the competition of some Western manufacturers. The Eastern manufacturers have accordingly made a reduction in their prices, and the discount on these goods now ranges from 50 and 10 to 60 per cent.

### Items.

At a meeting of the trustees of the E. D. Clapp Mfg. Company, Auburn, N. Y., D. E. Clapp was elected president in place of E. D. Clapp, to whose death we referred in our last issue. John T. Groves, for several years the manager of the company's Cincinnati agency, was elected secretary, thus filling the vacancy occasioned by the death of Phineas S. Hadger. Mr. Groves is said to be thoroughly familiar with the Carriage Hardware business, having traveled for Hayden & Smith when the latter were sole agents for the sale of the E. D. Clapp Mfg. Company's goods. Until he assumes the duties of his office B. C. Smith will act as secretary *pro tem*. The new president has for a long time held the position of treasurer of the company, and has been prominent in the business affairs of Auburn for years, during which time he has occupied different positions of trust and honor. He is thoroughly familiar with the business of the company, having grown up with it, and it is expected that under his management it will continue to occupy the prominent position it now holds.

John H. Clark has become the proprietor of the Hardware business of Charles H. Nutt, Nashua, N. H., in whose employ Mr. Clark has been for 22 years.

Matthai, Ingram & Co., Baltimore, Md., issue circulars relating to their improved Keyless Fly-Fans, the Royal Child's Tray and Improved Fruit Cans.

Among the special notices on page 48 is one in which the advantages of Des Moines, Iowa, for manufacturing enterprises are referred to. Several lines of railway, low freights, cheap coal, light taxes and other advantages are referred to.

The Erie Specialty Mfg. Company, Erie, Pa., have made still further additions to their line of tools, and they are all seasonable specialties. They are Walker's Double Cutter Ice-Shave and Adjustable Ice-Grip, Handy Ice-Plane and Beverage Mixer, and are fully described in a circular.

E. C. Meacham Arms Company, St. Louis, Mo., have issued their circular No. 410, dated June 19. Its 16 pages are devoted to a varied line of Revolvers, Rifles, Shotguns, &c., with some specialties. Quotations are attached in the usual way.

At the annual meeting of stockholders of the Essex Horse Nail Company, Essex, N. Y., held June 4, 1889, the following Board of Directors were elected: D. F.

Payne, H. H. Noble, W. D. Palmer, E. B. Atkins, W. G. Lyon, C. W. Woodford, A. B. Ross, T. McFarland and C. A. Martin. At the meeting of the Board of Directors the following officers were elected: D. F. Payne, president; H. H. Noble, vice-president; W. D. Palmer, secretary and treasurer. The report of last year's business was very satisfactory and the outlook for the future is referred to as encouraging. W. D. Palmer resumes the office of secretary and treasurer for the eleventh time.

The Bonney Rapid Vise Company, Clinton, Iowa, have issued a new catalogue calling attention to their new line of Vises, of the special features of which a full description is given, the different patterns being illustrated. In addition to emphasizing the merit of their Rapid Vises they call special attention to their Never Slip Pipe and Bench Vise, which embodies several novel features.

Suit has been brought against some Western manufacturers for infringement of Sunken-Hopper Coffee-Mill patents, owned by Logan & Strobridge Iron Company, New Brighton, Pa., and the Chas. Parker Company, Meriden, Conn.

The Reading Hardware Company have just gotten into their new works, a large portion of which was destroyed by fire some time ago. The new buildings are not only among the largest, but the most admirably equipped of the kind in this or any other country. They are believed to be absolutely fire-proof, while for light and air, combined with every possible convenience for their work-people, there appears to be nothing wanting. They employ upward of 700 hands, and are being run to their full capacity. In a recent circular they say:

We are pleased to announce that our new works are now completed and equipped throughout with the latest improved machinery, and have been in operation for some time. In addition to above, we shall continue to operate the Manhattan Works. The producing capacity of our new works is fully one-third more than that of our old plant, and we have no hesitancy in announcing that we are now in a position to fill all orders promptly. We have also been able during the past few months to manufacture and put in our warehouses, at Reading, New York, Chicago and Philadelphia, a well-assorted stock of our entire line of goods. We shall continue to keep all our popular finishes, including Geneva and Albion Bronzed, and Royal, Hecla, and Plain Bronze Metal, up to the high standard they have always had.

Surplus, Dunn & Alder, 97 Chambers street, New York, have been appointed direct representatives of the York Wire Cloth Company for the sale of their Wire Cloth. They have also been appointed by C. Hammond & Son, Philadelphia, as their representatives for the Southern States, export business, and the East and near-by trade.

As something of a curiosity, but at the same time illustrating the manner in which the daily newspapers refer to trade matters, we give the following, which recently appeared in a Cleveland paper. While Cleveland and Philadelphia are known as important points in this as in other branches of the Hardware and Iron trade, they will hardly claim the pre-eminence given them in the following paragraph, in which the writer's lack of familiarity with the matters in question is evident in nearly every line:

Among the latest accessions to the combinations is the Nut and Bolt Trust. Cleveland is known as a great Nut and Bolt manufacturing center, and this city and Philadelphia practically control the trade of the country. The Lamson & Sessions Company are among the largest manufacturers in America. A short time ago one of their representatives went to Youngstown, and as a result of his visit the two Nut and Bolt works there are in the combination. It is thought that the establishments in St. Louis will soon follow suit. The plan

pursued is a heroic one. If a manufacturer refuses to join the combination he is asked his price and his plant is purchased.

The Central Expanded Metal Company, Chess, Cook & Co., Pittsburgh, Pa., have issued a handsome catalogue illustrating their Steel Lathing and Netting, and explaining fully what Expanded Metal is and the uses to which it may be applied. Illustrations are given of the different-sized meshes from 4-inch down, and also of the Fencing-Gates, Window-Guards and other goods which are manufactured of it. Among these a Steel Door-Mat is to be noticed as a novelty. This catalogue is of especial interest, and is deserving the attention of those handling this line of goods.

Notice is given that the copartnership lately existing between L. S. St. John and J. W. St. John under the firm name of L. S. & J. W. St. John, Walton, N. Y., was dissolved on the 19th inst. by mutual consent. L. S. St. John will close up the business of the firm. He has also sold his interest to John P. White, and the business will be continued by the new firm of St. John & White.

R. Nickerson, W. B. Jackson and T. H. Nickerson announce that having purchased W. L. Child's interest in the firm of Childs, Nickerson & Co., Athens, Ga., assuming the liabilities and contracts of that firm, they will continue the business at the old location under the firm name of the Athens Hardware Company.

A recent issue of the Indianapolis *Herald* contains a description of Kokomo and its principal industries. Among these a prominent place is given to the Rockford Bit Company, whose factory is alluded to as one of the most complete in the city, and figures are given indicating the extent of its business. An illustration is given showing the works as originally built, but without the extensive improvements that have recently been added in order to accommodate the company's trade.

The R. Loveland Axe Company, Lamar, Pa., were badly damaged by a recent flood. Both their dams were torn out, embankments injured and in large part destroyed, houses carried away, &c., but they expect to be in operation by the middle of August. They desire to acknowledge the receipt of half a dozen Wheelbarrows from Pugsley & Chapman, 8 Liberty street, New York, which they generously donated them.

#### Obituary.

At a meeting of the National Association of Carriage Hardware Manufacturers of the United States, held on the 19th inst., the following resolutions, with reference to the death of their president, E. D. Clapp, which were reported by the Committee on Resolutions, composed of C. W. Scudder, J. M. Foote, D. F. Southwick and F. L. Cowles, were adopted:

*Whereas*, The National Association of Carriage Hardware Manufacturers of the United States is called upon to mourn the loss of its president, Emerous Donaldson Clapp, who died June 10, 1889;

*Resolved*, That we offer to his relatives and business associates our sincere sympathy, and feel deeply the loss of a presiding officer we all respected and loved, whose counsel and kindly word will long be missed and whose judgment and broad, comprehensive views have made him our leader in fact as well as in name since our organization, and whose loss is felt by each member as the loss of a personal friend.

*Resolved*, That the office of president remain vacant until the next annual election as a further expression of our regard, and that these resolutions be duly engrossed and also published in the several trade journals.

#### The Wire-Nail Card.

The Hardware dialogue which was given in our last issue under the heading of "How It Looks in the Country" has evidently been read by the trade with a good deal of interest. The points made in it have received the attention of the trade and our correspondence indicates that many retailers sympathize with the views there expressed. So radical a change as is attempted in the new card, with its change of base price and extension to the papered goods, would naturally cause some friction; but some of our correspondents, while acknowledging this, anticipate that after a little the trade will find the new card to work satisfactorily. There is, however, naturally some diversity of opinion in regard to the whole matter and our correspondents look at it from different points of view. Referring to the advance on the leading sizes of Standard Nails and the greatly diminished margin on the papered goods we have the following advices from a merchant in Vermont:

I hear some complaint from customers that the advance is quite sharp on the sizes that are used mostly, viz., 8d, 9d and 10d, and I have to try to explain to them that the price has advanced, but they say, "you must put them in at old price," which is rather hard to do. But on shelf goods in this branch I think the new card takes our margin right away. Any customer who has a Nail Card can tell just how much extra he should pay on a 1 pound paper of Brads, and we get only about 1 or 2 cents margin, while before, with the high list and liberal discount, we could get from 3 to 5 cents margin on a paper and the customer was satisfied. This part of the card I should like to see changed back to its former place. It is the dollars we are here for and not for convenience entirely.

Another merchant takes a more favorable view of the card, and finds the objection to it principally because it is another change, a thing for which the trade in general have a dislike:

In my travels over this section I have heard some fault found with the new card of extras. The fault seems to be based on a dislike for a change so soon after the adoption of the card of 1888, but I think it will work all right after the thing gets settled down and customers get a little more used to it. There is no special difficulty; only have to stop and explain to customers, and some of them have got to grumble at something, and the new card is that something at the present time.

Many retailers will doubtless consider it good business policy to say nothing to their customers about the new card, using it simply for convenience in buying, but making their own net prices in selling. This is the course adopted by our correspondent whose letter is given below, who at the same time alludes to the dialogue in our last issue:

We have not encountered the difficulties set forth in the dialogue, "How It Looks in the Country," because we have stopped talking "base price" to our customers, and when the price of Nails is asked we ascertain what size and then quote accordingly. Of course with "C. B." a word or two of explanation is necessary. "C. B." will readily come to see that there is no more reason why he should buy all sizes of Nails from 10d to 60d at the same price per keg than that he should buy all lengths of Screws from 1-inch to 3-inch at the same price per gross.

The following letter refers to the relative merit of Cut and Wire Nails, and suggests that the base on both should be 10d:

The price of Wire Nails has caused many who have been using them to take the Cut Nails. I sell now 100 kegs Cut to 10 Wire. The price is one thing and the holding in wood another that has brought

about the change. The old list with 10d for base on both Wire and Cut Nails would suit all the best.

The same idea is favored by a Massachusetts house, who write:

The idea of "How It Looks in the Country" is very good. The basis on Nails should start at 10d Nails. It saves lots of talk with people that do not understand about these things.

Still another merchant is disposed to take issue with the views expressed by one of our correspondents whose letter is given above, and favors the new card because it diminishes the difference that formerly existed between the price of the miscellaneous and the penny Nails, and also tends to reduce the number of extras to be carried in stock. After alluding favorably to the article in our last issue our correspondent adds:

The difference between keg Nails and those in papers was much too great and should have been equalized, and from our standpoint such a great number of extras would seem to be unnecessary, as they are certainly perplexing.

A Hardware house in this State thus emphatically condemns the new card:

We read with much interest as well as amusement the article in last week's *Iron Age* entitled "How It Looks in the Country." We fully concur with the writer thereof and think the article just "hits the nail on the head." We have been in no hurry to adopt the new Wire-Nail card owing to the fact that we had a fair stock of Wire Nails on hand when the change was made, and we feel that we have only just got the old card-rate working nicely with our customers and so dread making the change, as our trade is largely with the farmers, and it takes a vast amount of talking to convince them that they are not being imposed upon, and in this case we are somewhat of the opinion that such is the case. We would therefore have a poor show of convincing them that this new rate is either just or right. We shall make the change when obliged to and quote Wire Nails each size separate, without using the term base at all. We think these frequent and apparently absurd changes have a tendency to disgust merchants with the Wire-Nail trade, and the tendency will be to push good Steel Cut Nails.

We append a number of extracts from Hardware men in New England, leaving those from other parts of the country until our next issue:

NEW BRITAIN, CONN.—We have read the article entitled "How It Looks in the Country," and can say it is not overdrawn a particle. Many of our customers order Nails from time to time, and when they receive their bills at the end of the month it is hard to satisfy them why we charge 20 to 35 cents more on some sizes and less on others than previous month. However, we have become reconciled to it, and until manufacturers find out what Wire Nails cost them suppose we must submit. It certainly is very annoying to retailers.

RUTLAND, VT.—We find it difficult to introduce the new Wire-Nail card, and we continue as yet to sell on the old base. In my opinion the price should be the same from 10d to 60d.

CAMBRIDGEPORT, MASS.—We have no trouble in selling Wire Nails at the new card rate.

LEBANON, N. H.—The dialogue in last week's *Iron Age*, entitled "How It Looks in the Country," hits our case exactly. We think the manufacturers of Wire Nails would do well to make an average price on say 10's to 60's for a base and proper advance on other sizes. It certainly is very confusing and we think demoralizes trade, changing the card so often.

FALL RIVER, MASS.—We are not finding any such difficulties in the Nail list as our country friend speaks of. The Wire Nails are being taken here now in large quantities and are giving satisfaction.

BRIDGEPORT, CONN.—We think the Wire Nail card all right for the shelf goods, but should prefer to have had the Standard Nails nearer the Iron Cut Nails as to extras—then there would be less confusion.

PROVIDENCE, R. I.—The new Wire-Nail card is not received with any more disfavor than the last change of the Cut-Nail card was.

HARTFORD, CONN.—Our customers have hardly got accustomed to the new list as yet, but as far as we know they seem to like it, as the list is now more uniform.

WESTFIELD, MASS.—We have been very much surprised to read in *The Iron Age* for the last two or three weeks that the card was generally being received with favor. Diligent inquiry of traveling men failed to locate the place, and common sense refused to assign any reason why the public generally should approve of it. Were it not a serious matter and apparently approved by gentlemen worthy of respect, we should consider it simply the hasty work of some "smart Alecks" to be repudiated by their principals upon consideration.

NORWICH, CONN.—We have had very little comment as yet on the change in price of Wire Nails, the contractors to whom we sell the bulk of these goods not having had their attention called directly to it. The change will not be heard from until they get their July invoices.

PORTSMOUTH, N. H.—Our customers never take very kindly to the changes in lists. With us new lists always make more or less talk, and it takes some little time to get people to understand them, but they soon fall into the procession and accept it as a matter of course.

PAWTUCKET, R. I.—The sale of Wire Nails in this section is yet so limited that we don't experience any difficulty from the fact that people are not posted and we don't under present circumstances use the base price. It appears to us to have been an ill-considered change.

BANGOR, ME.—We have read the amusing dialogue. There is more truth than poetry in the story. The farmer wants plain, square dealing, and in order to gain his confidence the A, B, C's must be very plain. We have nine clerks in our retail department, and we figure that each man wastes an hour or two every day figuring the relative value and position of the new Wire-Nail card.

### Meeting of the New York State Association.

The meeting of the New York State Association of Hardware Jobbers, in Buffalo on the 20th inst., was well attended, and with the hearty reception given by the merchants of that city and the attentions which were shown to the members of the association the session is referred to as having been exceptionally enjoyable. The officers of the association are as follows:

President, Robert McCarthy, of McCarthy & Son, Syracuse  
Vice-president, C. E. Walbridge, of Walbridge & Co., Buffalo.  
Secretary and treasurer, James W. Eager, Syracuse.

In addition to the above the following members were present:

Robert Mathews, of Hamilton & Mathews, Rochester.  
Ross R. Spaulding, of Kennedy, Spaulding & Co., Syracuse.  
Mr. Barker, of Barker, Rose & Gray, Elmira.  
I. D. Booth, Elmira.  
Daniel Pratt, of Pratt & Co., Elmira.  
J. M. Goss, of Weaver & Goss Hardware Company, Rochester.  
C. M. Tillinghast, 2d, of J. M. Warren & Co., Troy.  
Mr. Sims, of Howe & Co., Troy.  
Mr. Turner, representing Morris E. Viele, Albany.  
George Dana, of Wright & Co., Utica.  
Mr. Parshall, of Parshall & Searle, Syracuse.

J. W. Black, of Burhans, Black & Co., Syracuse.

Hobart Weed, of Weed & Co., Buffalo.  
James R. Smith, of Weed & Co., Buffalo.  
Harry Walbridge, of Walbridge & Co., Buffalo.

Among the guests present who are not members of the association, we are advised, were the following: Mr. Deming, president of the George Worthington Company, Cleveland; H. S. Blossom, of W. Bingham Company, Cleveland; W. H. Cowles, secretary of the Cleveland Hardware Jobbers' Association, and E. H. Fowler, Buffalo delegate of the National Heavy Hardware Association.

The time of the association was divided between the consideration of matters of trade interest and the enjoyment of receptions and other social attentions. The forenoon session was devoted to social chit-chat with a view to promoting the best interests of the Hardware Jobbing Trade and increasing business by a cordial interchange of ideas and experiences. At 2 o'clock a sumptuous repast was served at the Niagara. At 4 o'clock the association accepted the invitation of Col. A. J. Barnard to go down the river to Falconwood, on Grand Island. Upon their return they were treated to a ride through the Park, and in the evening were banqueted at the Buffalo Club by Gen. E. B. Jewett.

A pleasant feature of the meeting was the receipt of a neatly executed card of invitation from the American Bit-Brace Company to visitors to inspect their works while in the city. It read as follows:

The American Bit-Brace Company extend you a cordial invitation to visit their office and factory while you are in our city. With several new, ingenious and very interesting special machines to exhibit we can promise you a pleasant time, and can show you how we turn out 100 dozen (Pedersen's) Bit-Braces complete daily. We are within two blocks of the depots, at Nos. 122, 124, 126 and 128 Washington street, corner Scott.

A. D. WHITE, Manager.

BUFFALO, June 20, 1889.

Those who attended the day after the meeting felt amply repaid, we are advised, for the time spent, expressing themselves that they had seldom seen so well-ordered and systematic a factory, most of the machinery in which was made especially for the particular requirements of making Bit-Braces. It was designed and made by their superintendent, Mr. Wilcox, and is referred to as exceedingly interesting and ingenious. In this way the American Bit-Brace Company did their share for the entertainment of the wholesale merchants of the State.

### Syndicate Buying.

There has been for a number of years a system by which some of the leading jobbing houses in the country have been represented in some of the principal markets by parties sometimes incorrectly designated as Syndicate Buyers, who by purchasing large quantities of goods and sometimes massing orders are in a position to secure favorable terms.

As bearing upon this question and the influence of such houses in the trade we have the following communication from a well-known manufacturing concern. It will be observed that the disturbing influence which syndicate buyers are supposed to exert upon the trade is especially referred to:

Within the last few years there has grown up a system in connection with the wholesale hardware business which, while it is pretty generally understood among the trade, has never as yet I believe been

recognized in your columns. I refer to what is known as "syndicate buying," the plan of which may be briefly described as follows:

B. & Co. hire an office in New York and hang out a sign designating themselves as "Purchasing and Commission Merchants," or by some other term that may mean much or little. They secure the patronage of a number of wholesale Hardware houses in different parts of the country for whom they arrange to act as New York buyers, each concern paying them a stipulated salary. B. & Co. then open correspondence with various manufacturers of Hardware, representing that they control the trade of so many wholesale men, and asking for the lowest prices that the said manufacturers will make, subject to a commission (generally 5 per cent.), which is to be paid to B. & Co. for securing the business. As a rule they find some smaller manufacturers, who do not keep men on the road, and who, being anxious to extend their trade, are willing to meet the lowest market price and allow the commission stipulated. The goods are generally shipped and billed to the different Hardware jobbers represented by B. & Co., and commissions paid to the latter by the manufacturer at the end of each month or quarter. B. & Co. then turn over to each of their patrons all the commissions they receive from their respective purchases, and whatever the Hardware jobber realizes from the commissions more than the salary he pays B. & Co. is, he figures, to him clear gain.

Such is a brief outline of the plan of the syndicate buyer. There is probably much more to it that could be best explained by the participants themselves, but the main parts have been given. The system is viewed in various ways by those who have had occasion to consider or discuss it. The Hardware jobbers who make up the various "syndicates" must of course think they are benefited or they would not pay their money to the New York buyer. On the other hand, it has been found that the jobbers who do not patronize the system are as a rule very bitter against it, some of them characterizing the buying concerns as "leeches on the Hardware trade," and going so far as to say that they will not purchase from manufacturers who sell any goods through these agencies.

The manufacturers are also divided in their opinions, some of them refusing to have anything to do with the syndicate buyers and others taking such business as they can see any margin in, reasoning that "one man's money is as good as another's." One bad feature in the situation for the manufacturer is that it withdraws from the market a number of buyers in different parts of the country, many of them in large business centers, substituting instead one purchasing agent in New York, through whom all the business must be negotiated. As a manufacturer will naturally figure closer and bid lower for the united trade of a dozen or more houses than he could for one, the result is a constant depression of prices and unsettling of the market. Furthermore, the manufacturer is really at a loss at this time to know who to quote, for reasons which can best be shown by an illustration.

The H. Mfg. Co. have been selling some goods through B. & Co., say at \$1 per dozen for a certain article, allowing 5 per cent. commission, realizing 95 cents net. F. & Co., Hardware jobbers in Chicago, write to the H. Mfg. Co. for "lowest prices, tallest discounts," &c. Supposing that they are bidding on an even plane with their competitors, the H. Mfg. Co. quote F. & Co. 97 cents per dozen for the article referred to above. Do they get the order? No; but shortly afterward

they receive a letter from B. & Co. saying "Our customers in the West are being quoted 97 cents. We expect you to meet this figure, subject to our 5 percent. commission; otherwise we will have to look elsewhere." The H. Mfg. Co. thus discover that they have been duped.

Experiences of this kind soon demonstrate to manufacturers that it avails nothing to quote *bona fide* prices to Hardware concerns who patronize the syndicate system, as the figures are only turned over to the New York agent, who makes it his business to find some one that will meet them and allow him a commission. But the trouble is that the number of the syndicates has so increased that it is not always easy to tell who belongs to them and who not; and in quoting prices to a new correspondent the manufacturer may unwittingly be playing into the hands of the New York purchasing agent, whose patrons use these means to keep him posted.

What, it may be asked, will be the outcome of this system? In the writer's opinion the Hardware concerns who compose the syndicates will in time discover that they are unable to obtain quotations from manufacturers direct, and are thus practically at the mercy of their New York representative, leaving them in a handicapped condition as compared with competitors, who can post themselves from all sources. They will then, I believe, make up their minds that it is best for every tub to stand on its own bottom, and that they can serve themselves best by withdrawing from the syndicate and acting independently. I may not have reasoned correctly in reaching this conclusion, and would be glad to see further discussion of the matter in your valuable columns.

It is proposed by certain parties to extend this system to retail houses, and we have seen a circular in which the plan to be pursued is thus outlined:

There has been established for a number of years among the largest jobbing houses throughout the United States a syndicate system of purchasing goods. They have a resident buyer at a central point to watch the market, secure "specials" and lump all orders, thus obtaining a quantity price on many goods much lower than could be obtained otherwise. We propose to inaugurate a similar system, with offices in New York and Philadelphia, for the benefit of the largest retailers and jobbers throughout the country, the advantages of which will be as follows:

1. All correspondents will have the privilege of having a permanent representative in the center of the Hardware industries, to whom all business matters can be referred, such as freight rates, allowances, freight insurance, &c.
2. A confidential price sheet will be mailed as often as obtainable, specifying any inside prices and special lots which we may be able to obtain.
3. We will lump all orders for staple goods, and thus obtain a price as low as the largest jobber, and in many instances lower, thus: Suppose 100 of our correspondents advise us that they can use, say, ten dozen Coal Hods; in the aggregate this would amount to 1000 dozen. The ability to place such a large order would enable us to secure a special price, which our correspondents will have the entire benefit of. This is merely a single instance of what can be done, as the same scheme will apply to all staple goods.
4. It often occurs that a merchant requires little odds and ends not directly in the Hardware business, and we will on solicitation hunt them up and buy them to the best advantage of our correspondents.

Any business man can see at once the great benefit derived by buying at bottom prices, and it is a proven fact that the plan of co-operative buying is successful,

and we are confident of earning for each of our correspondents an amount much greater than the trifling cost of our system. We will limit the number of our correspondents and will not accept more than one in cities of less than 100,000 population.

We shall be glad to hear further from manufacturers and merchants in regard to this question, which is one of direct and practical interest, as there appears to be at the present time something of a tendency toward the increase of this system.

### Duluth.

The growing commercial importance of this city is generally recognized, the indications pointing to it as destined to be before long one of the largest and most important trade centers of the West. Apart from its development in trade generally, enterprises are on foot looking to giving the city a prominence in the Hardware business which it has not heretofore occupied, and plans are being made for the erection of a Hardware building which will compare well with any in the country, and will have, it is expected, some special advantages in location and construction. The parties interested in this movement are the Wells-Chapin Company, whose building it is expected will be erected on Slip No. 1, Bay Front, on the dock of the Duluth Dock Company. It will be so situated on the harbor front that vessels can unload their cargoes at one side of the building, while railway cars will carry the sold product away from the other side. Thus is avoided the expense of drayage, and a saving is made both in money and time, of no little importance to the wholesaler. In regard to this building and its construction the following particulars are given:

The new building is to be built on plans of Palmer & Hall, architects, of this city, who have taken great pains in its designing. It will rest on 1200 piles, capable of sustaining a weight of 30,000 tons. There will be three rows of continuous piling around the outside, besides a row of sheet piles and nests of four, five and six piles under the whole interior. Its dimensions will be 100 x 100 feet, 5 stories high, reaching 72 feet to the brick cornice. The lower floor, which is designed for holding Flat and Heavy Iron and Steel, will be 19 feet high in the clear, and is calculated to sustain a load of 500 pounds to the square foot. The second floor is 12 feet high, those above it about 10 feet, and all will carry a load of 250 pounds to the foot. Ordinary heavy warehouses never carry more than 250 pounds to the foot, and a dense crowd of people is calculated at 80 pounds. Through the center of the building, sunken below the lower floor, will run a 14-foot drive for teams and delivery wagons for local trade.

The building will be what is known as mill or slow-burning construction and will be of brick, in plain but neat and massive architecture. There will be one large and one small elevator, each run by steam, and the elevator shafts and stair-ways will be inclosed in brick walls. Posts throughout the building will be of wood, and will be 12 feet apart. On these are to be laid built-up girders of 2 x 14 inch stuff spiked together, and on them the floor joist, also 2 x 14. On the lower floor these joists will be only 4 inches apart, making with the bridging and double floor an almost solid floor 18 inches thick. On other floors the joists will be 3 x 14, and 9 inches apart. Between the thicknesses of the floors will be fire-proof asbestos.

All the inside work is so put in that there will not be a single hidden timber in the entire structure, a fact much affected by insurance men. Indeed so closely are the laws of insurance companies carried out by Messrs. Palmer & Hall that it is stated the insurance rate will be only about 0.6 per cent., a rate which will make most of our builders stare in surprise. As it is calculated that a stock of Iron and Hardware averaging between \$200,000 and \$300,000 will be kept on hand, this question of insurance is of no little importance.

There will be an oil-room outside the building and a boiler-room to furnish power for elevators and for heat in one corner. Offices for the company will be on the second floor, and there will be fire-proof vaults on both first and second floors. The entire building will contain a little over an acre of floor space, and

its entire height can be packed full of Shelf and Heavy Hardware without danger of collapse or strain. Contracts will probably be let in a few days, and the work of construction carried out this summer.

### Exports.

PER BARK MARY A. GREENWOOD, MAY 28, 1889, FOR BRISBANE, QUEENSLAND.

By Recknapel & Co.—3 cases Washing-Machines. By Manning, Maxwell & Moore.—180 pounds Rail Saw, 18 pounds Iron Levers.

By Fairbanks & Co.—2331 pounds Scales, 1433 pounds Scales.

By McLean Bros & Rigg.—24 dozen Hatboxes.

By Arnold, Cheney & Co.—745 Wash-Boards, 240 boxes Clothes-Pins.

By Healy & Earl.—13 boxes Slate, 6 boxes Iron Grates, 2 cases Forges.

By W. Warden & Sons.—15 cases Axe Handles.

By A. S. Lascelles & Co.—32 dozen Axes, 16 dozen Axes, 6 dozen Picks, 20 dozen Hatchets,

6 dozen Axes, 48 dozen Hatchets, 8 cases Hardware, 6 cases Scales, 11 dozen Wrenches,

1 bundle Trucks, 1 box Wheels, 17 cases Handles, 6 dozen Lemon-Squeezers, 8 cases

Tacks, 336 dozen Nails, 1 dozen Saws, 14 dozen Braces, 2 dozen Braces, 440 dozen Washita

Stone, 3 cases Hardware, 3 cases Grease, 50 gross Lead-Pencils, 1 case Velocipedes, 7 cases

Cartridges and Shells, 1 case Tobacco-Cutters.

By H. W. Peabody & Co.—11 crates Stoves, 3 packages Lamp-Ware, 1 case Hardware, 16

cases Wind-Mills and Parts, 57 packages Carriage-Ware, 2 cases Agricultural Ma-

chinery, 10 cases Axes, 95 packages Hardware, 27 packages Barrows and Trucks, 1 case Sinks,

36 packages Refrigerators, 440 dozen Handles, 7 cases Hand-Carts, 177 packages Hardware,

54 crates Stoves, 4 cases Trucks, 45 bundles Wash-Boards, 23 cases Lamp-Ware, 2 cases

Freezers, 11 packages Pumps, 13 crates Refrigerators, 4 cases Fire-Arms, 32 cases

Handles, 10 cases Trucks, 10 packages Wagons, 44 packages Carriage-Ware, 8 cases Perambula-

tors, 6 cases Lamp-Ware, 2 cases Castings, 8 packages Agricultural Implements, 68 cases

Hardware, 17 cases Fire-Arms, 72 packages Refrigerators.

By R. W. Forbes & Son.—40 packages Stoves,

40 dozen Picks, 8 packages Fruit Jars, 8 pack-

ages Fruit Jars, 50 dozen Axes, 25 gross Shade-

rollers, 10 packages Hardware, 110 dozen

Picks, 12 packages Corn-Shellers, 40 dozen

Shovel Handles, 108 dozen Tool Handles, 4

cases Hardware, 15 gross Shade-Fasteners,

50 dozen Wash-Boards, 15 packages Hardware,

6 packages Shellers, 1 1/4 gross Shade-Rollers,

2 packages Plated-Ware, 5 packages Meat-

Choppers, 1 package Shade-Fasteners, 4 crates

Rake Handles, 2 dozen Snaths, 3 bundles

Tools, 3 dozen Forks, 3 dozen Rakes, 7 pack-

ages Hardware, 1 gross Shade-Rollers, 6 7-12

gross Fly-Traps, 3 packages Hardware, 3 racks

Churns, 2 gross Sewing-Machine Oil, 12 dozen

Hoes, 22 dozen Hatchets, 18 dozen Hoes, 5

gross Shade-Fasteners, 6 gross Pencils, 2 1/4

dozen Meat-Choppers, 14 packages Stoves,

500 feet Rubber Hose, 30 dozen Axes, 11 cases

Hardware, 9 gross Lead-Pencils, 5 gross Axe

Grease, 3 packages Plated-Ware, 1 box Lamp-

Ware, 1 package Plated-Ware, 1 case Store

Trucks, 248 dozen Axe-Handles, 8 dozen

Mouse-Traps, 10 dozen Axes, 4 dozen Ham-

mers, 27 packages Stoves, 4 gross Sewing-Ma-

chine Oil, 6 cases Meat-Choppers, 2 gross

Shade-Rollers, 6 dozen Wire Wash-Stands, 6

dozen Rakes, 37 dozen Fork Handles, 1 case

Pumps, 1 package Rat-Traps, 2 cases Hard-

ware, 10 dozen Axes, 5 sets Wheels, 30 dozen

Hoe Handles, 4 packages Windmills, 10 pack-

ages Stoves, 2 dozen Axes.

PER SCHOONER GELLERT, JUNE 4, 1889, FOR FREEMANTLE, AUSTRALIA.

By R. W. Cameron & Co.—9 dozen Brooms, 50 boxes Clothes-Pins, 25 dozen Axes and Hatchets, 20 dozen Picks, 386 dozen Handles, 15 packages Carriage-Ware, 12 Churns, 5 dozen Rakes, 3 1/4 dozen Fork and Hoe Handles, 6 dozen Hammers, 7 dozen Hardware, 3 dozen Scales, 24 dozen Perambulators, 2022 pounds Pumps, 186 pounds Guns and Cartridges, 6 cases Carriages, 5 boxes Clocks, 11,246 pounds Wire, 14 Wagons.

### REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

#### Paints and Colors.

National Lead Trust affairs continue to engage the attention of the trade, as well as the interest of speculators in "industrial" securities. The trade anxiously awaits the policy of the trust as regards prices, rebates, delivery points, &c., and, incidentally, the successful management of the business so that it may earn dividends upon the highly inflated capital. The





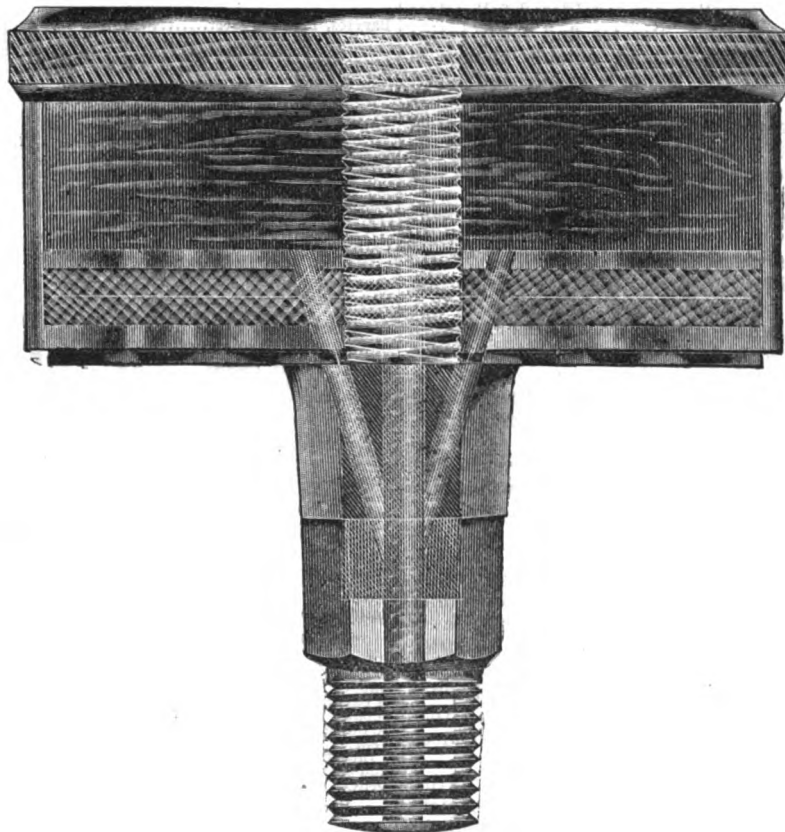
### The Perfection Solid Oil-Box

The oil-box of which we herewith present an engraving is manufactured by Charles H. Bealy & Co., of Chicago, Ill., expressly for the use of their Helmet oil. The box consists of a cap into the center of which is cast a screw fitting into a thread cut in the top of the lower part. The cap is filled with oil, which is forced into the oil groove and spread by the re-

two years, and it is said that they have not been touched during that time. They are as tight now as when first put on. This nut-lock is made by E. R. Procter, of Cincinnati, Ohio.

### New Coat and Hat Hook.

The accompanying illustration represents a new wire coat and hat hook which is put on the market by Sargent & Co.,

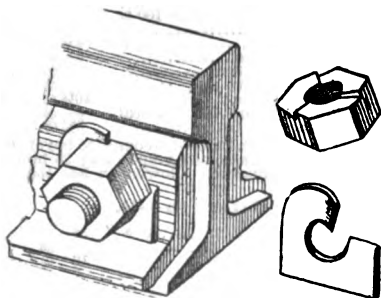


*The Perfection Solid Oil-Box.*

volving shaft by screwing the top down upon the lower part. The periphery of the lower part is filled with woven cotton packing, making a tight joint, preventing wear and protecting it from dust. The boxes can be applied in any position—from above, below or at the side, on loose pulleys, connecting-rods, bearings, &c. The box should fit snugly in the bearing, with the end placed about  $\frac{1}{4}$  inch from the shaft.

### Nut-Lock Washer.

This nut-lock consists of a ratchet-formed nut adapted to engage with a toothed washer of crucible steel. The



*Nut-Lock Washer.*

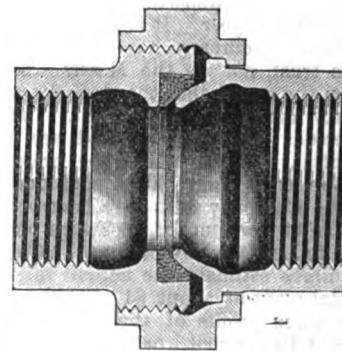
tooth formed by the washer locks squarely against the nut, which is shaped to receive it, so that the nut always remains tight. Screwing the nut down tight locks it. The first tried nut-locks of this pattern have been on the track one and a half and

gross. The illustration, without detailed description, shows the special features and manner of the hook's construction.

A cargo of copper ore from Montana via San Francisco arrived at this port last week, destined to France.

### The Keystone Pipe-Joint.

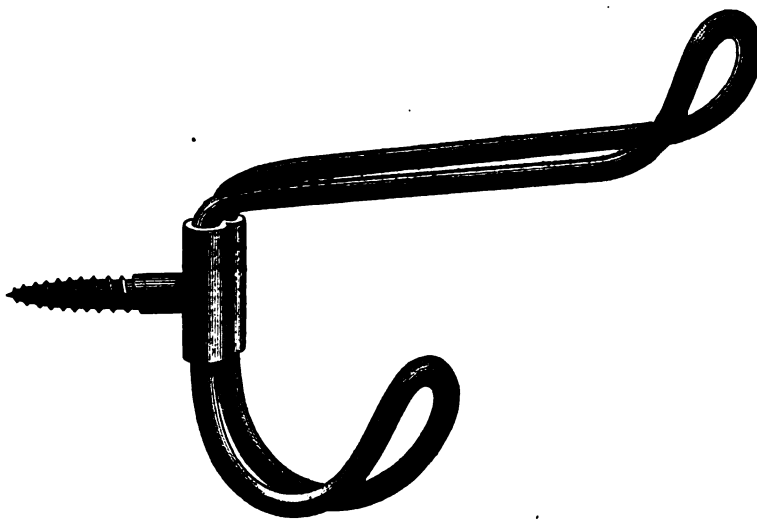
The makers of this joint, Stanley G. Flagg & Co., of Philadelphia, Pa., claim that it makes a superior joint for radiator work and gives much better satisfaction



*The Keystone Pipe-Joint.*

than anything else yet made for the purpose, as it is not affected by the contraction and expansion to which other unions are liable. The form of the union is shown in the engraving. The seat formed in the head-piece by the concave soft-metal seat and in the tail-piece by the convex-finished surface is not damaged or injured by use, being as good after having been in use, taken down and put up again as when first put in. The soft-metal seat is pressed into an under-cut groove in the head-piece and expanded so that it cannot lose its position, but must remain firmly in place. The seat is made at any possible angle and can be loosened or tightened at pleasure without injury, standing without leaking 200 pounds steam-pressure. It is stated that these unions are used extensively in gas, steam and water pipe connections, and that they have been favorably indorsed by all who have used them.

A letter from a gentleman who stands high in business and official circles in the City of Mexico states that, so far, the Mexican Government has given no intimation that it will appoint commissioners to the Congress of American States in October. President Diaz is doubtless vexed by the dilatoriness of the United States in

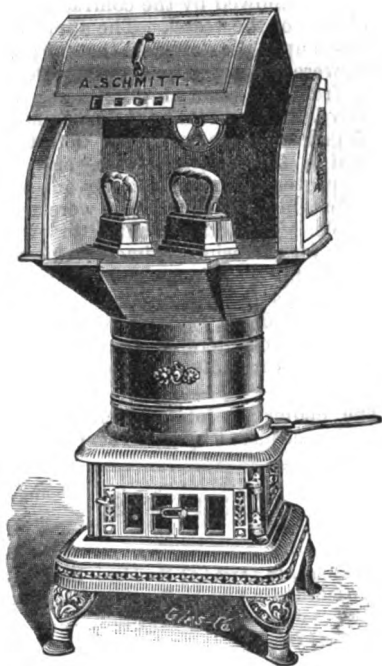


*New Coat and Hat Hook.*

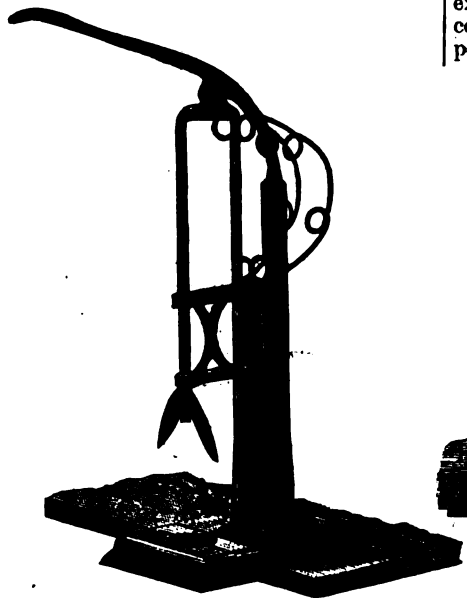
promoting reciprocal relations, and may not deem it politic to manifest special anxiety on the subject. The Government has sought, rather, judging from surface indications, to show that the European market is as important to Mexico as any other.

**Schmitt's Sad-Iron Heater.**

By means of the accompanying illustration we present a smoothing and sad iron heater invented by Mr. Anselm Schmitt, of No. 850 Seneca street, Buffalo, N. Y. The object of the invention is the production of a stove particularly adapted for

*Schmitt's Sad-Iron Heater.*

heating flat and smoothing irons for laundry and tailors' use. The feature of construction is the plate on which the irons to be heated are placed. Double walls lined with asbestos are provided, within which are flues and ducts for the passage of the products of combustion. The construction is such that the heated gases are concentrated below the plate on which the irons

*Fig. 1.—Eureka Fruit-Pitter.*

rest and pass from beneath the middle portion through openings with which it is provided. The manufacturer states that in this manner the plate is always kept very hot, while but little heat is allowed to escape into the room. It can also be converted into a heating-stove in winter by removing the inside flues and asbestos lining. It is stated that fire can be kept in this stove without trouble day and night and that it is an easy matter to keep the

stove and surrounding floor free from dirt and ashes. The stove was patented April 30, 1889.

**The Improved Eureka Fruit-Pitter.**

This article, which is manufactured by Farnsworth & Co., San Francisco, Cal., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, is illustrated in the accompanying en-

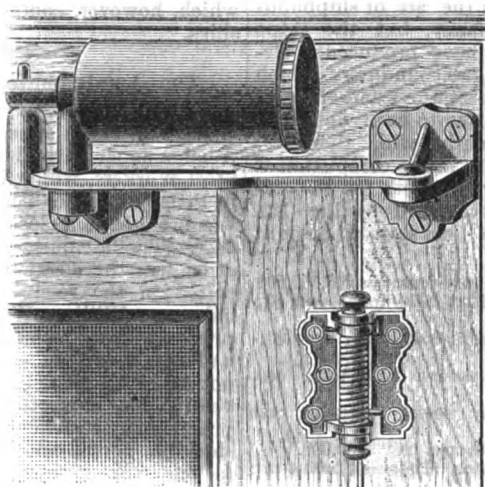
gravings, Fig. 1 giving a general view of the machine when not in use, and Fig. 2 showing the manner in which the pit is extracted from the fruit. It will thus be seen that this machine is attached to a table or other support in convenient position for use. The peach or other fruit is placed upon a rubber cushion, in which it rests, which has a hole in it through which the pit is forced. Connected with this cushion there is a knife which at the same time cuts the bottom of the peach and holds it in position until the cutter and extractor, which is operated by a handle, comes down upon it, simultaneously expelling the pit and cutting the fruit in

*Fig. 2.—Extraction of the Pit.*

two. The points made in regard to this tool are that it does not bruise the fruit and does its work perfectly and much more expeditiously than it can be done by hand. It is also stated that it can readily be adapted to work by foot-power if desired. It is intended for use with peaches, plums, apricots, nectarines, &c., and parties in ordering should specify what kind of fruit it is intended for. Unless ordered a plum-fitting cushion is not sent.

**The Chic Screen-Door Check.**

The use of door-checks has become so common that a door having a spring to shut it and without one of the several devices to prevent its slamming is a rare exception. So general has the spring and check been brought into use that the old "Shut the Door" signs, formerly so familiar on store doors, are now seen only as relics of former annoyances, and the

*The Chic Screen-Door Check.*

pictorial artists are devoting their leisure to more pleasing objects. Doing away with the slamming of ordinary doors has directed attention to the slamming of wire-screen doors as they are shut by the spring hinges so generally used. The door checks heretofore made have not usually been suitable for screen doors, and are too expensive if they were otherwise practicable, but the Chic Screen-Door Check illustrated herewith has been made especially for this purpose. Sargent & Co., the manufacturers, describe it as follows: The new patent Chic Screen-Door Check is suitable for either right or left hand without changing any of the parts; it is easily applied, and can be used with any screen-door spring or spring hinge. The pressure acts toward the hinges and holds the door firmly in position. The piston is inclosed within the cylinder to prevent the summer dust from interfering with its free working. It effectually prevents slamming and can be placed on any screen door. By screwing the cap at the end of cylinder the check can be instantly varied to suit the tension of the door-spring or spring hinges that may be used.

An extraordinary instance of long hours of labor was related recently before the Sweating Committee of the British House of Lords. A Roumanian Jew stated that at Manchester he works from 5 o'clock in the morning until 12 at night, and sometimes until 1 or 2 in the morning, making an average of 20 hours a day for six days in the week, leaving only four hours for sleep. He earned three shillings a day in the busy time, lasting about ten weeks, and from six shillings to eight shillings per week in the slack season, and on this he had to support a wife and children.

The Supreme Court of Ohio has pronounced the illegality of chattel mortgages and other methods to which insolvent debtors resort for the purpose of giving preferences to creditors on the eve of an assignment. The court decides that such preferences are void, and that the entire property of the assignor must be disposed of for the benefit of all the creditors.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 25, 1889.

The Government having fairly started in the building of new ships for the navy, the work may now be expected to go on more rapidly. The construction of steel ships of the intricate designs adapted to modern naval uses, offensive and defensive, was necessarily slow in the beginning, when this branch of the art of shipbuilding was in its infancy, but the ships already constructed have produced a development in this great industry which will lead to more expectations and effective results than have hitherto been obtained. The next few months will, therefore, witness great activity in the completion of plans and awarding contracts for the additional vessels authorized by the late Congress. The new steel ships to be built this year are:

One armed cruiser, 7500 tons; cost \$3,500,000.  
One protected cruiser, 5300 tons; cost \$1,800,000.  
Two protected cruisers, 3000 tons; cost \$1,100,000 each.  
Three protected cruisers, 2000 tons; cost \$700,000 each.  
One naval academy vessel, 800 tons; cost \$260,000.  
Two gun-boats, 1000 tons; cost \$350,000.  
One cruising monitor (Thomas), 3000 tons; cost \$1,500,000.

The contracts are being awarded as rapidly as the drawings and specifications are completed.

The vessels launched or ready to be launched are the 4000 to 4500 ton cruisers Philadelphia, Baltimore and Charlestown, and the gun-boats Yorktown, Concord and Bennington, each 1700 tons, and Petrel 800 tons. The great 6500-ton armored line-of-battle-ship Maine and armored cruiser Texas being constructed at the New York and Norfolk navy-yards are now fairly under way. Here are 20 of the finest vessels afloat of their class, which will be ready within from six months to two years. The cruisers Atlanta, Boston, Chicago and Dolphin are already in commission. The five reconstructed monitors will also add a formidable element of fighting strength.

The progress of the United States to the rank of a first-class naval power has not been confined to paper. The authorization of vessels by the new Congress will even be greater. From all indications, before the close of the present Administration the United States will have at least 50 of the finest types of modern vessels of war displaying the flag of the Republic in the seaports of the globe.

The Navy Department is in receipt of information that the shaft for the Philadelphia, building at the Cramp Yard, has been delivered. It is 65 feet long and 17 inches in diameter, or the largest piece of steel forging ever produced in the United States. It was the first work of the character turned out at the steel plant of the Bethlehem Iron Works, constructed under their contracts with the Government.

### A PIG-IRON DECISION.

An appeal was recently made to the Treasury Department from the decision of the collector at Chicago assessing duty at the rate of  $\frac{3}{8}$  cent per pound on certain imported ferro-silicon. The appellants claim that the article is not the pig-iron of commerce, but is a metal composed of iron and silicon and is used by iron manufacturers to melt with pig-iron, and that it is, therefore, entitled to entry at the rate of 20 per cent. ad valorem under the provision for "metal unwrought, not specially provided for." The appraiser reports that the article is ordinary pig-iron, containing about 10 per cent. of silicon, and is used in mixing with low grades of pig-iron to increase the percentage of silicon, thereby

strengthening the product, and that its value is about one-third more than ordinary pig-iron. The Department has decided that the fact that the article contains a larger proportion of silicon than ordinary pig-iron does not remove it from the category of pig-iron, and has affirmed the decision of the collector. That officer has been informed that the distinction between ferro-silicon and chrome pig-iron lies in the fact that chrome pig-iron is made from a combination of iron and chromic ores, while ferro-silicon is made from a single ore, which, however, contains both iron and silica.

### The Amalgamated Association.

The fourteenth annual convention of the Amalgamated Association of Iron and Steel Workers, which has been in session in Pittsburgh since Tuesday, the 4th inst., was brought to a close on the night of the 21st. The last business before the association was the election of officers, and resulted in the re-election of all the old officers. William Weihe, who has been president of the association for six years, had announced all along that he would not allow his name to go before the convention for re-election, but was chosen president by acclamation, and after considerable persuasion he consented to serve for one more year at least. For the position of secretary there were two candidates, William Martin, the present incumbent, and Stephen Madden, the present assistant secretary. Mr. Martin was elected by a vote of 117 to 71 and Mr. Madden was elected assistant secretary. James Penney was elected treasurer without opposition. The convention then adjourned, to meet in Pittsburgh next June.

It is reported from Pittsburgh that the association granted the application of the bolt-makers for admission to the organization. This will necessitate a bolt-makers' scale. The general strike assessment measure suggested by the American Federation of Trades Unions, whereby all members of the federation are assessed in case of a strike in any of the trades unions, was adopted. An amendment was also passed permitting the admission of a large number of men about the mills who heretofore could not join the organization. Everybody who is employed about the mills can now be freely admitted, with the exception of common laborers. This latter question is left to the discretion of the local lodges to whom the laborers may apply for admission. The association, which has been so conservative, has finally reached out its arms and embraces every class of iron or steel workers. The change will make the Amalgamated Association a stronger competitor of the Knights of Labor for the membership of workmen who could join the Knights of Labor, but owing to the laws of the order could not join the Amalgamated Association.

It is now expected that there will be no strike or trouble of any kind in the Western iron industry this year, but a reduction in the steel mills is probable. The iron scale of wages in force during 1888-89 has been revised, and there are but few changes; in fact, the alterations made in most cases are favored by the manufacturers. It wipes out many objectionable features, and although some new clauses are inserted they are not of a serious character. A complete revision of the scale for nail-cutting was made, averaging a reduction of over 45 per cent.

We have received from Alex. Y. Lee, architect and civil engineer, Pittsburgh, a very fine lithographic sketch entitled "A Bird's-eye View of the Conemaugh Valley," giving the topographical characteristics of the section of country from Conemaugh Lake to Nineveh which was de-

vastated by the flood of May 31. Separate views are given of the South Fork Dam, the watershed of the lake, &c. Copies are for sale by the author.

The Secretary of the Navy has granted the request of the Union Iron Works, of San Francisco, who are building the cruiser Charleston, for an extension of four months in the time allowed by the contract for the completion of the vessel. The application was based upon the statement that the plans, which were purchased by the Navy Department from English ship-builders, were defective. In the case of the machinery it is alleged that the principal defect developed in the last trial trip, and that which prevented its success, was one of design, for which the contractors were not responsible. The other contractors whose requests for extension of time have been denied will appeal to Congress for relief. The extension granted will operate to remit the penalties for delay, which have already accrued in a considerable amount, having averaged about \$150 a day for some time.

The claims of John Roach's assignees are being adjusted by the Government.

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# CURRENT HARDWARE PRICES.

JUNE 26, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Cape, Percussion, W 1000—  
Hicks & Goldmark's  
F. L. Waterproof, 1-10's.....50¢  
E. B. Trimmer Edge, 1-10's.....65¢  
E. B. Grnd. Edge, Cent. Fire, 25 & 1-10's.....75¢  
Double Waterproof, 1-10's.....\$1.40  
Musket Waterproof, 1-10's.....50¢  
G. D.....25¢  
S. B.....30¢

Union Metallic Cartridge Co.  
F. C. Trimmer.....50¢  
F. L. Ground.....65¢  
Cent. Fire Ground.....70¢  
Dbl. Waterproof, in 1-10's.....\$1.40  
Dbl. Waterproof, Imp.orted.....54¢  
Eley's E. B.....54¢  
Eley's D Waterproof, Central Fire.....\$1.00

Cartridges.  
Rim Fire Cartridges.....50¢&52¢  
Rim Fire Military.....15¢&2¢  
Cent. Fire, Pistol and Rifle.....25¢&52¢  
Cent. Fire, Military and Sporting.....15¢&52¢  
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.  
Blank Cartridges, 22 cal., \$1.75.....2¢  
Blank Cartridges, 32 cal., \$3.50.....2¢  
Primed Shells and Bullets.....15¢&52¢  
B. B. Caps, Round Ball, \$1.75.....2¢  
B. B. Caps, Con. Ball, Swgd., \$2.00.....2¢

Primers—  
Berdan Primers, \$1.00.....2¢  
B. L. Caps (for Sturtevant Shells) \$1.00.....2¢  
All other Primers, \$1.20.....2¢

Shells—  
First quality, 4, 8, 10 and 12 gauge.....25¢&102¢  
First quality, 14, 16 and 20 gauge (\$10 list).....30¢&102¢  
Star, Club, Rival and Climax brands.....20¢&102¢  
Selbold's Comb. Shot Shells.....15¢&2¢  
Brass Shot Shells, 1st quality.....60¢&2¢  
Brass Shot Shells, Club, Rival, Climax.....65¢&2¢  
I X L, 10 and 12 gauge.....40¢&52¢  
"Special," 16 gauge.....30¢&102¢  
"Special," 10 and 12 gauge.....40¢&102¢  
Fowler's Pat.....\$3.25

Shells Loaded—  
A. M. Co. List No. 19, 1887.....40¢&102¢  
Wads—  
U. M. C. & W. R. A.—B. E., 11 up.....\$2.00  
U. M. C. & W. R. A.—B. E., 9&10.....2.30  
U. M. C. & W. R. A.—B. E., 7&8.....2.60  
U. M. C. & W. R. A.—P. E., 11 up.....8.10  
U. M. C. & W. R. A.—P. E., 9&10.....4.00  
U. M. C. & W. R. A.—P. E., 7&8.....4.90  
Eley's B. E., 11 up.....\$1.75  
Eley's P. E., 11 up.....2.80

Anvils.—  
Eagle Anvil, W 104.....20¢&20¢  
Peter Wright's.....9¢  
Armstrong's Mouse Hole.....8¢  
Armstrong's Mouse Hole, Extra 11½.....11¢  
Trenton.....9¢  
Wilkinson's.....9¢  
J. & Riley Carr. Pat. Solid.....11¢  
Moore & Barnes Mfg. Co.....33¢

Anvil Vise and Drill—  
Millers Falls Co., \$18.00.....20¢  
Cheney Anvil and Vise.....25¢  
Allen Anvil and Vise, \$3.00.....40¢&102¢

## Apple Parers—

Advance.....\$ dos \$4.75  
Antrim Combination.....\$ dos 5.50  
Baldwin.....\$ dos 5.25  
Champion.....\$ dos 7.25  
Eureka, 1888.....each 17.00  
Family Bay State.....\$ dos 12.00  
Gem.....\$ dos 5.25  
Gold Medal.....\$ dos 4.00  
Daisy.....\$ dos 3.75  
Ideal.....\$ dos 4.75  
Improved Bay State.....\$ dos 30.00  
Little Star.....\$ dos 4.00  
Monarch.....\$ dos 13.50  
New Lightning.....\$ dos 5.50  
Oriole.....\$ dos 4.00  
Penn.....\$ dos 4.00  
Perfection.....\$ dos 4.00  
Pomona.....\$ dos 4.00  
Rocking Table.....\$ dos 5.25  
Turntable.....\$ dos 4.50  
Victor.....\$ dos 13.50  
Waverly.....\$ dos 4.50  
White Mountain.....\$ dos 4.50  
72.....\$ dos 4.25  
76.....\$ dos 5.75  
78.....\$ dos 6.50

## Augers and Bits—

Douglas Mfg. Co.....70¢  
Wm. A. Ives & Co.....70¢  
Humphreysville Mfg. Co.....70¢  
French, Swift & Co. (F. H. Beecher, Rockford Bit Company)  
Cook's, Douglas Mfg. Co.....55¢  
Cook's, N. H. Copper Co. 50¢&102¢  
Ives' Circular Lip.....60¢  
Patent Solid Head.....30¢  
C. E. Jennings & Co., No. 10, extension lip.....40¢  
C. E. Jennings & Co., No. 30.....60¢  
C. E. Jennings & Co., Auger Bits, 3 set, 32¼ quaters, No. 6, \$5; No. 30, \$3.50, 30¢  
Lewis' Patent Single Twist.....45¢  
Jennings' Augers and Bits.....25¢  
Imitation Jennings' Bits.....60¢&60¢  
Pugh's Black.....45¢  
Rockford, Jennings' Patterns.....30¢  
Car Bits.....50¢&102¢  
L'Hommedieu Car Bits.....15¢&102¢  
Forstner Pat. Auger Bits.....10¢

## Hollow Augers—

Ives'.....33¼¢  
French, Swift & Co.....33¼¢  
Douglas.....33¼¢  
Bonney's Adjustable, \$ dos \$48.....40¢&102¢  
Stearns.....20¢&102¢  
Ives' Expansive, each \$4.50.....50¢&5¢  
Universal Expansive, each \$4.50.....20¢  
Wood's.....25¢&25¢&102¢

## Expansive Bits—

Clark's small, \$18; large, \$36.....35¢&35¢  
Ives' No. 4, \$ dos \$90.....40¢  
Swan's.....40¢  
Stearns, No. 1, \$25; No. 2, \$32.....35¢  
Stearns' No. 2, \$48.....20¢

## Gimlet Bits—

Common.....\$ gross \$2.75 to \$3.25  
Diamond.....\$ dos \$1.10.....25¢&102¢  
Bee.....25¢&25¢  
Double Cut, Sheppardson's.....45¢&45¢  
Double Cut, Ct. Valley Mfg. Co.....30¢&102¢  
Double Cut, Hartwell's, \$ gro.....\$5.25  
Double Cut, Douglas.....40¢&102¢  
Double Cut, Ives.....60¢&102¢

## Bit Stock Drills—

Morse Twist Drills.....50¢&102¢  
Standard.....50¢&102¢  
Cleveland.....50¢&102¢  
Syracuse, for metal.....50¢&102¢  
Syracuse, for wood (wood list) 30¢&30¢  
Williams' or Holt's, for metal 50¢&102¢  
Williams' or Holt's, for wood.....40¢&102¢

## Ship Augers and Bits—

L'Hommedieu's.....15¢&102¢  
Watrous.....15¢&102¢  
Snell's.....15¢&102¢  
Snell's Ship Auger Pat'n Car Bits.....15¢&102¢

## Awl Hafts—

Sewing, Brass Fer. \$ gr. \$3.50.....45¢&102¢  
Pat. Sewing, Short, \$1.00 \$ dos.....40¢&102¢  
Pat. Sewing, Long.....\$ dos \$1.20  
Pat. Peg, Plain Top, \$ gr \$10.00.....45¢&102¢  
Pat. Peg, Leather Top, \$ gr \$12.00.....45¢&102¢

## Awls, Brad Sets, &c—

Awls, Sewing, Common \$ gr \$1.70, 35¢  
Awls, Should. Peg \$ gr \$2.45, 40¢&102¢  
Awls, Pat. Peg \$ gr \$3.75, 40¢&102¢  
Awls, Shouldered Brad, 2.70 \$ gr.....45¢  
Awls, Handled Brad, \$7.50 \$ gr.....45¢  
Awls, Handled Scratch \$ gr \$7.50, 35¢&102¢  
Awls, Socket Scratch \$ dos \$1.50, 25¢&30¢

## Awl and Tool Sets—

Alken's Sets, Awls and Tools, No. 20, \$ dos \$10.00.....55¢&102¢  
Frax's Adj. Tool Hdl., Nos. 1, \$12; 2, \$13; 3, \$12; 4, \$9.....25¢&25¢  
Miller's Falls Adj. Tool Hdl., Nos. 1, \$12; 2, \$18.....25¢  
Henry's Combination Haft.....\$ dos \$6.50  
Brad Sets, No. 45, \$10.50; No. 43, \$12.50, 70¢&102¢  
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$6.50.....30¢&102¢

## Axes—

Makers' and Special Brands—  
First quality.....\$ dos \$5.00 to \$6.50  
Others.....\$ dos \$5.50 to \$5.75

## Axle Grease—

Fraser's.....Keg \$ 4¢, Pall \$ 5¢  
Fraser's, in boxes.....\$ gr \$0.50  
Dixon's Everlasting, in bxs.....\$ dos 1¢  
Dixon's Everlasting.....1¢; 2¢ \$2.00  
Lower grades, special brands.....\$ gr \$5.50 to \$7.00

## Axles—

No. 1.....4¢&4¢, No. 2 5¢&5¢  
Nos. 7 to 14.....5¢&5¢  
Nos. 15 to 18.....47¢  
Nos. 19 to 22.....70¢  
National Tubular Self-Oiling Standard Farm (1 to 5) and Special Farm (A1 to A5):  
Less than 10 sets.....33¢  
Over 10 sets.....33¢&5¢

## Bag Holders—

Sprenkle's Pat.....\$ dos \$18.....60¢

## Balances—

Spring Balances.....50¢  
Common 24.....\$ dos \$1.50.....50¢  
Chatillon's Spring Balances.....50¢  
Chatillon's Circular Spring Balances.....60¢

## Bells—

### Hand—

Light Brass.....70¢&102¢  
Extra Heavy.....60¢&102¢  
White Metal.....60¢&102¢  
Silver Chime.....33¢&102¢  
Globe (Cone's Patent).....25¢&102¢

### Door—

Gong, Abbe's.....33¢&102¢  
Gong, Yankee.....45¢&102¢  
Gong, Barton's.....40¢&102¢  
Crane, Taylor's.....25¢&102¢  
Crane, Brooks'.....50¢&102¢  
Crane, Cone's.....10¢

Crane, Connel's.....20¢&102¢  
Lever, Sargent's.....60¢&102¢  
Lever, Taylor's Bronzed or Plated.....net  
Lever, Taylor's Japanned.....25¢&102¢  
Lever, R. E. M. Co.'s.....50¢&102¢  
Pull, Brook's.....50¢&102¢  
Pull, Western.....25¢&102¢

### Cow—

Common Wrought.....60¢&102¢  
Western.....20¢&102¢  
Western, Sargent's list.....70¢&102¢  
Kentucky, "Star".....20¢&102¢  
Kentucky, Sargent's list.....70¢&102¢  
Dodge, Genuine Kentucky.....70¢&102¢  
Texas Star.....50¢&102¢  
Farm Bells.....\$ 3¢&3¼¢  
Steel Alloy Church and School Bells.....40¢

## Bellows—

Blacksmiths'.....50¢&102¢  
Molders.....40¢&102¢  
Hand Bellows.....40¢&102¢

## Belting, Rubber—

Common Standard.....70¢&102¢  
Standard.....70¢&102¢  
Extra.....60¢&102¢  
N. Y. B. & P. Co., Carbon.....60¢&102¢  
N. Y. B. & P. Co., Diamond.....50¢&102¢

## Bench Steps—

Morrill's.....\$ dos \$0.50  
Hotchkiss's.....\$ dos \$5.10 to \$10.10  
Weston's, No. 1, \$10; No. 2, \$0.25 to \$10.25  
McGill's.....\$ dos \$3.....10¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

## Bit Holders—

Extension, Barber's \$ dos \$15.00.....40¢&102¢  
Ives, \$ dos \$20.00.....60¢&102¢  
Diagonal.....\$ dos \$24.00, 40¢  
Angular.....\$ dos \$24.00, 40¢&5¢

## Blind Adjusters—

Domestic.....\$ dos \$3.00, 33¼¢  
Excelsior.....\$ dos \$10.00.....50¢&102¢  
Washburn's Self-Locking.....20¢&20¢

## Blind Fasteners—

Macrell's \$ dos \$1.00.....20¢&20¢  
Van Sand's Screw Pat., \$15 \$ gr.....60¢&102¢  
Van Sand's Old Pat., \$15.00 \$ gr.....55¢&102¢  
Washburn's Old Pattern, \$ gr.....\$0.00  
Merriman's.....new list  
Austin & Eddy No. 2008, \$ gr.....\$0.00  
Security Gravity, \$ gr.....\$0.00

## Blind Staples—

Barbed, ¼ in. and larger.....\$ 7¢&8¢  
Barbed, ½ in.....\$ 8¢&9¢

## Blocks—

Ordinary Tackle, list May 20, 1889.....40¢&102¢  
Cleveland Block Co., Mal. Iron.....50¢  
Moore's Novelty, Mal. Iron.....50¢

## Belts—

### Door and Shutter—

Cast Iron Barrel, Square, &c.....70¢&70¢  
Cast Iron Shutter Bolts.....70¢&70¢  
Cast Iron Chain (Sargent's list).....65¢&102¢  
Ives' Patent Door Bolts.....60¢  
Wrought Barrel.....70¢&102¢  
Wrought Square.....70¢&102¢  
Wrt Shutter, all Iron, Stanley's.....60¢&102¢  
Wrt Shutter, Brass Knob.....40¢&102¢  
Wrt Shutter, Sargent's list.....60¢&102¢  
Wrt Sunk Flush, Sargent's list.....55¢&102¢  
Wrt Sunk Flush, Stanley's list.....50¢&102¢  
Wrt B.K. Flush, Com'n.....55¢&102¢

### Carriage, Machine, &c.—

Com. list June 10, '84.....75¢&102¢  
Genuine Eagle, list Oct. '84.....75¢&102¢  
Phila. pattern, list Oct. '74, '84, 75¢&102¢  
R. B. & W., old list.....75¢&102¢  
Machine, according to size.....75¢&102¢  
Bolt Ends, according to size.....75¢&102¢

### Tire—

Common, list Feb. 28, '83.....70¢  
Port Chester Bolt and Nut Company: Empire, list Feb. 28, '83.....70¢  
Phila., list Oct. '84.....82¢  
Keystone, Philadel., list Oct. '84.....80¢  
Norway, Phila., list Oct. '84.....75¢&102¢  
American Screw Company: Eagle, Phil., list Oct. 16, '84.....80¢  
Phila., list Oct. 16, '84.....82¢  
Bay State, list Feb. 28, '83.....70¢  
R. B. & W., Philadel., list Oct. 16, '84.....82¢

### Stove and Plow—

Stove.....65¢  
Plow.....60¢&5¢  
R. B. & W., Plow.....55¢

## Borax—

Without Augers.....\$ 9¢&10¢

## Boring Machines—

Without Augers. Upright. Angular.  
Douglas.....\$5.50 to \$6.75.....50¢  
Snell's, Rice's Pat. 5.50 6.75.....40¢&102¢  
Jennings.....5.50 6.75.....45¢&102¢  
Other Machines.....2.35 2.75.....net  
Phillips' Patent with Augers.....00 7.50.....

## Bow Pins—

Humason, Beckley & Co.'s.....60¢&102¢  
Sargent & Co.'s.....\$17 and \$18.....60¢&102¢  
Peck, Stow & W. Co.....50¢&102¢

## Braces—

Barber's, Nos. 10 to 16.....50¢  
Nos. 30 to 32.....50¢  
Nos. 40 to 63.....50¢&102¢  
Barker's, Nos. 8, 10 and 12.....75¢&102¢  
Plated, Nos. 8, 10 and 12.....65¢&102¢  
Osgood's Ratchet.....40¢&102¢  
Spofford's.....50¢&50¢  
Ives' New Haven Novelty.....70¢&70¢  
New Haven Ratchet.....60¢&102¢  
Barber Ratchet.....60¢&102¢  
Barbers.....60¢&102¢  
Spofford.....60¢&102¢  
Common Rail, American.....\$1.00 to \$1.10  
Bartholomew's, Nos. 25, 27 and 30.....60¢&102¢  
Nos. 117, 118, 119.....70¢&70¢  
Amidon's Barker's Imp'd Plain.....75¢&102¢  
Barker's Imp. Nicked.....65¢&102¢  
Ratchet.....75¢&102¢  
Eclipse Ratchet.....60¢  
Globe Jawed.....40¢&102¢  
Corner Brace.....40¢&102¢  
Universal, 8 in., \$2.10; 10 in.....\$2.25  
Buffalo Ball.....\$1.10 to \$1.15  
P. S. & W.....50¢&102¢

## Brackets—

Shelf plain, Sargent's list, 55¢&102¢  
Shelf, fancy, Sargent's list, 60¢&102¢  
Reading, plain.....50¢&102¢  
Reading, Rosette.....60¢&102¢

## Bright Wire Goods—

.....87½¢

## Broilers—

Henis' Self-Inch.....9 10 9x11  
Basting, } Per doz.....\$4.50 5.50 6.50

## Buckets—See Well Buckets and Pails.

## Bull Rings—

Union Co. Nut.....55¢  
Sargent's.....60¢&102¢  
Hotchkiss' low list.....30¢  
Humason, Beckley & Co.'s.....70¢  
Elrich Hdw. Co., White Metal, low list.....50¢&102¢

## Butcher's Cleavers—

Bradley's.....25¢&30¢  
L. & J. White.....20¢&5¢  
Beatty's.....40¢&102¢  
New Haven Edge Tool Co.'s.....40¢  
P. S. & W.....33¢&5¢  
Foster Bros.....30¢  
Schulte, Lohoff & Co.....40¢&102¢

## Butts—

### Brass—

Wrought Brass.....75¢&75¢  
Cast Brass, Tiebout's.....33¢  
Cast Brass, Corbin's, Fast.....33¢&102¢  
Cast Brass, Loose Joint.....33¢&102¢

### Cast Iron—

Fast Joint, Narrow.....50¢&102¢  
Fast Joint, Broad.....55¢&102¢  
Loose Joint.....55¢&102¢  
Loose Joint, Japanned.....55¢&102¢  
Loose Joint, Jap. with Acorns.....70¢&102¢  
Parliament Butts.....70¢&102¢  
Mayer's Hinges.....70¢  
Loose Pin, Acorns.....70¢  
Loose Pin, Acorns, Japanned.....70¢  
Loose Pin, Acorns, Japanned, Plated Tips.....70¢

### Wrought Steel—

Fast Joint, Narrow.....70¢  
Fast Joint, Lt. Narrow.....70¢  
Fast Joint, Broad.....70¢  
Loose Joint, Broad.....70¢  
Table Butts, Back Flaps, &c.....70¢  
Inside Blind, Regular.....70¢  
Inside Blind, Light.....70¢  
Loose Pin.....70¢  
Bronzed Wrought Butts.....50¢

## Callipers—

### See Compasses.

## Calks, Toe—

Gautier.....\$ 5¢&6¢  
Dewicks (Burke).....\$ 5¢&6¢

## Can Openers—

Messenger's Comet.....\$ dos \$3.00, 25¢  
American.....\$ gross \$3.00  
Duplex.....\$ dos 25¢, 15¢&20¢  
Lyman's.....\$ dos \$3.75, 20¢  
No. 4 French.....\$ dos \$2.50, 5¢&5¢  
No. 5, Iron Handle.....\$ dos \$3.00, 45¢&5¢  
Eureka.....\$ dos \$2.50, 10¢  
Sardine Scissors.....\$ dos \$2.75 to \$3.00  
Star.....\$ dos \$2.75  
Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50  
World's Best, \$ gross, No. 1, \$12.00  
No. 2, \$24.00; No. 3, \$36.00.....50¢&102¢  
Universal, \$ dos \$3.00.....35¢&5¢  
Domestic, \$ dos \$2.50.....45¢  
Champion \$ dos \$2.00.....50¢

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Cross-Cut Saw Handles—  
Atkins' No. 1 Loop, pair 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.  
Boynton's Loop Saw Handles, 50¢... 60¢  
Champion..... 15¢

**Hangers—**  
Barn Door, old patterns..... 60¢10¢10¢70¢  
Barn Door, New England..... 60¢10¢10¢70¢  
Samson Steel Anti-Friction..... 50¢  
Orleans Steel..... 50¢  
Hamilton Wrought Wood Track..... 50¢  
U. S. Wood Track..... 50¢  
Champion..... 60¢10¢  
Rider and Wooster, Medina Mfg. Co.'s List..... 70¢  
Climax Anti-Friction..... 60¢  
Himax Anti-Friction for Wood Track..... 50¢  
Zenith for Wood Track..... 50¢  
Ed's Steel Arm..... 50¢  
alliance, Barn Door..... 50¢  
Sterling's Imp'vd (Anti-Friction)..... 60¢10¢  
Victor, No. 1, \$15.00; No. 2, \$15.50; No. 3, \$18.00..... 50¢25¢  
Cheritree..... 60¢10¢  
Kiddie's..... 60¢10¢20¢  
The Boss..... 60¢10¢  
Best Anti-Friction..... 60¢10¢  
Duplex (Wood Track)..... 60¢10¢5¢  
Terry's Pat., 7/8 doz pr. 4 in, \$10.00; 5 in, \$12.00..... 60¢10¢5¢  
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.40; No. 6, \$18.00..... 60¢10¢5¢  
Wood Track Iron Clad, 7/8 ft. 10¢..... 50¢  
Carrier Steel Anti-Friction..... 50¢50¢5¢  
Architect, 7/8 set \$6.00..... 30¢  
Ediplex..... 30¢10¢  
Felix, 7/8 set \$4.50..... 30¢  
Richards'..... 30¢10¢10¢  
Lane's Steel Anti-Friction..... 30¢10¢10¢  
Ball Bearing Door Hanger..... 30¢10¢25¢10¢  
Warner's Pat..... 30¢10¢10¢  
Stearns' Anti-Friction..... 30¢10¢10¢  
Stearns' Challenge..... 25¢10¢25¢10¢10¢  
Faulstich..... 40¢40¢5¢  
American, 7/8 set \$6.00..... 30¢10¢  
Rider & Wooster, No. 1, 3/4; No. 2, 7/8..... 40¢  
Paragon, Nos. 1, 2 and 3..... 40¢10¢  
Paragon, Nos. 5, 6, 7 and 8..... 30¢10¢  
Crescent..... 60¢10¢10¢  
Nickel, Cast Iron..... 30¢  
Nickel, Malleable Iron and Steel..... 40¢  
Scranton Anti-Friction Single Strap..... 40¢  
Scranton Anti-Friction Double Strap..... 40¢  
Universal Anti-Friction..... 40¢  
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00..... 40¢10¢  
Star..... 40¢10¢40¢10¢5¢  
May..... 50¢5¢50¢10¢  
Barry, \$6.00..... 40¢10¢

#### Harness Snaps—See Snaps.

**Hatchets—**  
List Jan. 1, 1888..... 35¢40¢  
Isiah Block..... 40¢5¢  
Hunt's Shingling, Lath and Claw..... 40¢  
Hunt's Broad..... 40¢  
Buffalo Hammer Co..... 40¢10¢50¢  
Hurd's..... 40¢10¢50¢  
Fayette R. Plumb..... 40¢10¢50¢  
Wm. Mann, Jr., & Co..... 50¢5¢40¢  
Underhill's Edge Tool Co..... 40¢5¢40¢10¢  
Underhill's, Haines and Bright..... 35¢4¢  
C. Hammond & Son..... 40¢10¢50¢  
Stimmons'..... 40¢10¢50¢  
Peck's..... 40¢10¢40¢10¢5¢  
Kelly's..... 50¢50¢50¢5¢  
Sargent & Co..... 50¢50¢50¢5¢  
Ten Eyck Edge Tool Co..... 40¢10¢40¢10¢5¢  
Collins..... 10¢  
Schulte, Lohoff & Co..... 50¢50¢50¢5¢

**Hay and Straw Knives—**  
Lightning, Mfrs' price 7/8 doz \$18.00, 25¢  
But jobbers frequently give extras.  
Gem..... 7/8 doz \$10  
Wadsworth's..... 40¢7/8 doz \$10  
Carter's Needle..... 10¢  
Heath's..... 7/8 doz \$13.50; 14.00  
Auburn Hay, Com. and Spear Point..... 50¢  
Auburn, Straw..... 40¢  
Nollin's Hay..... 7/8 doz \$10.00

**Hinges—**  
**Wrought Iron Hinges**  
Strap and T..... 75¢5¢75¢10¢  
Screw Hook and Strap..... 6 to 12 in., 7/8 doz \$3.50; 14 to 20 in., 7/8 doz \$4.50; 22 to 36 in., 7/8 doz \$5.50  
Heavy Wielded..... 14 to 20 in., 7/8 doz \$3.50; 22 to 36 in., 7/8 doz \$4.50  
Screw Hook..... 14 in., 7/8 doz \$1.50; 18 in., 7/8 doz \$2.45; 22 in., 7/8 doz \$3.50  
and Eye..... 18 in., 7/8 doz \$3.50  
Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢  
Rolled Blind Hinges, No. 232 and 234..... 55¢10¢  
Rolled Plate..... 70¢10¢  
Rolled Raised..... 70¢10¢  
Plate Hinges (8, 10 & 12 in., 7/8 doz \$5; "Providence" over 12 in., 7/8 doz \$4)  
**Spring Hinges—**  
Geer's Spring and Blank Butts..... 40¢  
Union Spring Hinge Co.'s List, March, 1888..... 30¢  
Acme..... 30¢  
U. S..... 25¢10¢  
Empire and Crown..... 30¢  
Hero and Monarch..... 55¢  
American, Gem, and Star..... 30¢  
Oxford..... 30¢  
Barker's Double Acting..... 30¢10¢  
Union Mfg. Co..... 30¢  
Bonner's..... 30¢  
Buckman's..... 15¢20¢  
Chicago..... 30¢  
Wiles..... 10¢  
Devore's..... 40¢  
Rex..... 40¢  
Royal..... 60¢  
Reliable..... 60¢  
Champion..... 60¢

**Gate Hinges—**  
Western..... 7/8 doz \$4.40, 80¢  
N. E. Reversible..... 7/8 doz \$7.00, 55¢  
N. E. Reversible..... 7/8 doz \$6.25, 40¢  
Clark's, Nos. 1, 2, 3..... 60¢10¢5¢  
N. Y. State..... 7/8 doz \$5.00, 55¢10¢  
Automatic..... 7/8 doz \$12.50, 50¢  
Common Sense..... 7/8 doz pair \$4.50, 50¢  
Seymour's..... 45¢10¢5¢  
Shepard's..... 60¢10¢5¢  
Reed's Latch and Hinges..... 7/8 doz \$12.00, 50¢  
**Blind Hinges—**  
Parker..... 75¢25¢  
Palmer..... 60¢5¢10¢  
Seymour..... 70¢25¢  
Nicholson..... 45¢10¢  
Huffer..... 50¢

Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢5¢80¢  
Clark's Mortise Gravity..... 50¢  
Sargent's, Nos. 1, 3, 5, 11, 13..... 77¢10¢10¢  
Sargent's, No. 12..... 75¢10¢55¢10¢5¢  
Reading's Gravity..... 75¢10¢75¢10¢5¢  
Shepard's..... 75¢10¢5¢  
Noiseless..... 75¢10¢5¢  
Niagara..... 30¢25¢  
Buffalo..... 30¢5¢  
Clark's Genuine Pat..... 30¢5¢  
O. S., Lull & Porter..... 75¢10¢30¢  
Acme, Lull & Porter..... 75¢5¢  
Queen City Reversible..... 75¢  
Clark's Lull & Porter, Nos. 0, 1, 1 1/4, 2 1/4, 3..... 75¢10¢35¢  
North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50; No. 3, for Brick, \$13.50..... 25¢25¢

#### Hoes—

**Handled—**  
Garden, Mortar, &c..... 65¢  
Planter's, Cotton, &c..... 65¢  
Warren Hoe..... 60¢  
Magic..... 7/8 doz \$4.00  
**Eye—**  
D. & H. Scovill..... 30¢  
Lane's Crescent Planter's Pattern..... 45¢5¢  
Lane's Razor Blade, Scovill Pattern..... 30¢  
Maynard, S. & O. Pat..... 45¢5¢  
Sandusky Tool Co., S. & O. Pat..... 60¢  
Hubbard & Co., S. & O. Pat..... 60¢  
Chattanooga Tool Co., S. & O. Pat..... 60¢  
Grub..... 60¢10¢10¢

**Hog Rings and Ringers—**  
Hill's Improved Ringers..... 7/8 doz \$4.25  
Hill's Old Style Ringers..... 7/8 doz \$2.75  
Hill's Tongue..... 7/8 doz \$4.50  
Hill's Rings..... 7/8 doz bxs \$2.15; \$2.25  
Perfect Ringers..... 7/8 doz bxs \$1.00; \$1.70  
Blair's Hog Ringers..... 7/8 doz \$2.15; \$2.25  
Blair's Hog Rings..... 7/8 doz \$2.00; \$2.00  
Champion Ringers..... 7/8 doz \$2.00  
Champion Rings, Double..... 7/8 doz \$2.25  
Brown's Ringers..... 7/8 doz \$2.00  
Brown's Rings..... 7/8 doz \$1.25; \$1.30

**Hoisting Apparatus—**  
Moore's Hand Hoist, with Lock..... 30¢  
Brake..... 30¢  
Moore's Differential Pulley Block..... 40¢  
Energy Mfg. Co.'s..... 25¢

**Holders, File and Tool—**  
Bals Pat..... 7/8 doz \$4.00; 25¢  
Nicholson File Holders..... 20¢

#### Hollow-Ware—

**Iron—**  
**Stove Hollow-Ware—**  
Ground..... 60¢60¢5¢  
Unground..... 60¢10¢60¢10¢10¢  
Boilers and Saucepans..... 40¢5¢  
Tinned Boilers and Saucepans..... 40¢  
Gray Enamelled-Ware..... 45¢50¢  
Stove..... 45¢50¢  
Maslin Kettles..... 60¢10¢60¢10¢5¢  
Bakers..... 40¢5¢  
Agate and Granite Ware, list Jan. 1, 1889..... 35¢10¢  
Rustless Hollow-Ware..... 50¢50¢5¢  
Galvanized Tea-Kettles..... 50¢50¢5¢

Inch..... 6 7 8 9  
Each..... 55¢ 60¢ 65¢ 75¢  
**Silver Plated—**  
4 mo. or 5 1/2 cash in 30 days.  
Reed & Barton..... 40¢5¢  
Meriden Britannia Co..... 40¢5¢  
Stimpson, Hall, Miller & Co..... 40¢5¢  
Rogers & Brother..... 40¢5¢  
Hartford Silver Plate Co..... 40¢5¢  
William Rogers Mfg. Co..... 40¢5¢5¢

**Hooks—**  
**Cast Iron—**  
Bird Cage, Sargent's list..... 60¢10¢10¢  
Bir Cage, Reading..... 60¢10¢10¢  
Clothes Line, Sargent's list..... 60¢10¢10¢  
Clothes Line, Reading list..... 60¢10¢10¢10¢  
Ceiling, Sargent's list..... 55¢10¢10¢  
Harness, Reading list..... 55¢10¢10¢10¢  
Coat and Hat, Sargent's list..... 55¢10¢10¢10¢  
Coat and Hat, Reading..... 50¢10¢50¢10¢70¢

**Wrought Iron—**  
Cotton..... 7/8 doz \$1.25  
Cotton Pat. (N.Y. Mallet & Handle W'ks)..... 30¢  
Tassel and Picture (T. & S. Mfg. Co.)..... 50¢  
Wrought Staples, Hooks, &c..... 60¢10¢  
See Wrought Goods.  
**Wire—**  
Wire Coat and Hat, Gem, list April, 1886..... 50¢  
Wire Coat and Hat, Miles', list April, 1886..... 50¢  
Indestructible Coat and Hat..... 45¢  
Wire Coat and Hat, Standard..... 45¢  
Belt..... 30¢10¢10¢

**Miscellaneous**  
Grass, No. 2, \$2.00; No. 3, \$3.25; No. 4, \$2.50  
Nollin's Grass..... 7/8 doz \$2.25  
Bush..... 65¢60¢  
Whiffletree—Patent..... 55¢  
Hooks and Eyes—Malleable Iron..... 70¢70¢10¢  
Fish Hooks, American..... 60¢  
Bench Hooks..... See Bench Stops.

**Horse Nails—**  
Nos. 6 7 8 9 10  
Ausable..... 28¢ 26¢ 25¢ 24¢ 23¢  
Clinton, Fin..... 24¢ 22¢ 21¢ 20¢ 19¢  
Essex..... 28¢ 26¢ 25¢ 24¢ 23¢  
Lyra..... 25¢ 23¢ 22¢ 21¢ 20¢  
Snowden..... 25¢ 23¢ 22¢ 21¢ 20¢  
Putnam..... 23¢ 21¢ 20¢ 19¢ 18¢  
Vulcan..... 23¢ 21¢ 20¢ 19¢ 18¢  
Northwest..... 25¢ 23¢ 22¢ 21¢ 20¢  
Globe..... 23¢ 21¢ 20¢ 19¢ 18¢  
Boston..... 23¢ 21¢ 20¢ 19¢ 18¢  
A. C..... 25¢ 23¢ 22¢ 21¢ 20¢  
C. B. K..... 25¢ 23¢ 22¢ 21¢ 20¢  
Champlain..... 28¢ 26¢ 25¢ 24¢ 23¢

New Haven..... 28¢ 26¢ 25¢ 24¢ 23¢  
Saranac..... 23¢ 21¢ 20¢ 19¢ 18¢  
Champion..... 23¢ 21¢ 20¢ 19¢ 18¢  
Capewell..... 28¢ 26¢ 25¢ 24¢ 23¢  
Star..... 23¢ 21¢ 20¢ 19¢ 18¢  
Anchor..... 23¢ 21¢ 20¢ 19¢ 18¢  
Western..... 23¢ 21¢ 20¢ 19¢ 18¢  
Empire Bronzed..... 14¢ 13¢  
Horse Shoes—See Shoes Horse.

**Hose, Rubber—**  
Competition..... 75¢10¢75¢10¢5¢  
Standard..... 70¢70¢10¢  
Extra..... 60¢10¢10¢  
N. Y. B. & P. Co., Para..... 50¢  
N. Y. B. & P. Co., Dundee..... 60¢10¢5¢

**Huakus—**  
Hair's Adjustable..... 7/8 gr \$8.00  
Hair's Adjustable Clipper..... 7/8 gr 7.00

**Indurated Fiber-Ware.**  
Spitstons, No. 2, 7/8 doz..... \$6.75  
Basins, Ringed, 7/8 doz, No. 1, \$3.70; No. 2, \$3.10; No. 3..... \$3.70  
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), 7/8 doz, nested..... \$16.87  
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), 7/8 doz, nested..... \$8.37  
Butter Bowls, 15, 17 and 19-inch (3 pieces), 7/8 doz, nested..... \$8.75  
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), 7/8 set..... \$8.00  
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), 7/8 set..... \$2.55  
See also Pails.

**Jack Screws—See Screws.**

**Kettles—**  
Spun, Stamped.  
Brass, 7 to 17 in., 7/8 doz..... 24¢ 21¢  
Brass larger than 17 in..... 20¢ 23¢4¢  
Enamelled and Tea Kettles..... See Hollow-Ware.

**Keys—**  
Lock Ass'n list Dec. 30, 1888..... 50¢10¢  
Eagle, Cabinet, &c..... 60¢5¢  
Hotchkiss' Brass Blanks..... 40¢  
Hotchkiss' Copper and Tinned..... 40¢  
Hotchkiss' Pad, and Cab..... 35¢  
Ratchet Red Keys..... 7/8 doz \$4.00; 15¢  
Wollensak Tinned..... 50¢10¢

#### Knife Sharpeners—

Parkin's.....  
Applewood Handles..... 7/8 doz \$5.00, 40¢  
Rosewood or Cocobolo..... 7/8 doz \$5.00, 40¢

**Knives—**  
Wilson's Butcher Knives..... 25¢30¢  
Ames' Butcher Knives..... 35¢  
Foster Bros' Butcher, &c..... 40¢  
Nichols' Butcher Knives..... 40¢10¢  
Ames' Shoe Knives..... 20¢25¢  
Ames' Bread Knives..... 7/8 doz \$1.50, 15¢20¢  
Moran's Shoe and Bread..... 20¢  
Ray and Straw..... See Ray Knives.  
Table and Pocket Knives..... See Cutlery.  
Corn, Auburn Mfg. Co. Western Pat..... \$2.50  
Corn, Auburn Mfg. Co. Crescent..... \$2.50

**Knobs—**  
Door Mineral..... 65¢68¢  
Door Por. Jap'd..... 75¢78¢  
Door Por. Nickel..... \$2.00; \$2.25  
Door Por. Plated, Nickel..... \$2.00; \$2.25  
Drawer, Porcelain..... 60¢10¢60¢10¢10¢  
Hemacite Door Knobs..... 40¢10¢50¢  
Yale & Towne Wood, list Dec., 1888..... 40¢  
Furniture Plain..... 75¢ gro inch 10¢  
Furniture Wood Borews..... 25¢10¢  
Base, Rubber Tip..... 70¢10¢5¢  
Picture, Judd's..... 60¢10¢10¢70¢  
Picture, Sargent's..... 70¢10¢  
Picture, Hemacite..... 35¢5¢  
Shutter, Porcelain..... 65¢10¢  
Carriage, Jap..... 7/8 gro 30¢, 60¢10¢

**Lades—**  
Melting, Sargent's..... 55¢10¢  
Melting, Reading..... 35¢10¢  
Melting, Monroe's Pat..... 7/8 doz \$4.00, 40¢  
Melting, P. S. & W..... 35¢10¢40¢  
Melting, Warner's..... 30¢

**Lawn Mowers—**  
Standard List..... 50¢10¢  
Quaker City..... 60¢10¢  
Enterprise..... 60¢10¢

**Lanterns—**  
**Tubular—**  
Plain with Guards, 7/8 doz..... \$4.00; \$4.25  
Lift Wire, with Guards..... \$5.00; \$4.75  
Square Plain, with Guards..... \$4.00; \$4.25  
Sqr. Lift Wire, with Guards..... \$4.25; \$4.50  
Without Guards, 25¢ 7/8 doz less.  
**Miscellaneous.**  
Police, Small, \$3.00; Medium, \$7.25; Large, \$9.75..... 20¢25¢

**Lemon Squeezers—**  
Porcelain Lined, No. 1..... 7/8 doz \$6.00, 25¢30¢  
Wood, No. 2..... 7/8 doz \$3.00, 35¢  
Wood, Common..... 7/8 doz \$1.70; \$1.75  
Dunlap's Improved..... 7/8 doz \$3.75, 20¢  
Samuels..... No. 1, \$5.00; No. 2, \$6; 12..... 25¢10¢  
Jennings' Star..... 7/8 doz \$2.50  
The Boss..... 7/8 doz \$2.50  
Dean's..... No. 1, 7/8 doz \$6.50; 2, \$3.25; 3..... \$1.90  
Little Giant..... 50¢50¢5¢  
King..... 40¢5¢

**Lines—**  
Cotton and Linen Fish, Draper's..... 50¢  
Draper's Chalk..... 60¢  
Draper's Mason's Line, 34 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25..... 25¢  
Cotton Chalk..... 55¢  
Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50..... 10¢  
Silver Lake, Braided, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50..... 25¢  
Mason's Line, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50..... 45¢  
Mason's Colored Cotton..... 18 19 20  
Wire Clothes..... Nos. 18 19 20 \$3.60 \$3.00 \$2.5

Ventilator Cord, Samson Braided, White or Drab Cotton, 7/8 doz \$7.50, 20¢

#### Locks, &c.—

**Door Locks, Latches, &c.**  
List Dec. 30, '88, chgd Feb. 2, '89..... 60¢10¢60¢10¢  
R. & E. Mfg. Co., list Mar. 20, 1889..... 60¢10¢  
Mallory, Wheeler & Co., list July, '88..... 50¢10¢60¢10¢  
Sargent & Co., list Aug. 1, '88..... 55¢25¢  
Reading Hardware Co., list Feb. 2, '88..... 55¢60¢10¢  
Note.—Lower net prices often made.

Perkins' Burglar Proof..... 60¢25¢  
Plate..... 35¢25¢  
F. Many's "Extension Cylinder" \$10.50..... 7/8 doz.  
Barnes Mfg. Co..... 40¢40¢10¢  
Yale..... net prices  
Deits Flat Key..... 30¢  
L. & C. Round Key Latches..... 30¢10¢  
L. & C. Flat Key Latches..... 35¢10¢  
Romer's Night Latches..... 15¢  
Shepardson or U. S..... 35¢  
Felter or American..... 40¢10¢  
Seed's N. Y. Hasp Lock..... 25¢

**Cabinet—**  
Eagle, Gaylord Par., list March, '84, rev ker and Corbin..... Jan. 1, '85, 35¢45¢  
Deits, Nos. 35 to 39..... 40¢10¢  
Deits, Nos. 51 to 63..... 40¢10¢  
Deits, Nos. 85 to 96..... 30¢  
Stoddard Lock Co..... 30¢25¢4¢  
"Champion" Night Latches..... 40¢  
Barnes Mfg. Co..... 40¢40¢10¢  
Eagle and Corbin Trunk..... 60¢25¢  
"Champion" Cab. and Combin..... 35¢  
Yale..... net prices  
Romer's..... 35¢

**Padlocks—**  
List Dec. 30, '84..... 75¢75¢10¢  
Yale Lock Mfg. Co.'s..... net prices  
Eagle..... 25¢25¢  
Eureka, Eagle Lock Co..... 40¢25¢  
Romer's, Nos. 0 to 91..... 30¢  
Romer's Scandinavian, &c., Nos. 100 to 150..... 50¢. 15¢  
A. E. Deits..... 40¢  
Champion Padlocks..... 40¢  
Hotchkiss..... 30¢  
Star..... 40¢  
Hornshoes..... 7/8 doz, \$9. 40¢40¢10¢  
Barnes Mfg. Co..... 40¢40¢10¢  
Nock's..... 30¢  
Brown's Pat..... 35¢  
Scandinavian..... 30¢40¢10¢  
Fram's Pat. Scandinavian low list..... 60¢  
Ames Sword Co. up to No. 150..... 40¢  
Ames Sword Co. above No. 150..... 50¢

#### Lumber Tools.

Ring Peavies, "Blue Line"..... 7/8 doz \$20.00  
Ring Peavies, Common..... 7/8 doz \$18.00  
Steel Socket Peavies..... 7/8 doz \$21.00  
Mail Iron Socket Peavies..... 7/8 doz \$19.00  
Cant Hooks, "Blue Line"..... 7/8 doz \$16.00  
Cant Hooks, Common Finish..... 7/8 doz \$14.00  
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish..... \$16.00  
Cant Hooks, Mail Socket Clasp, Common Finish..... 7/8 doz \$14.50  
Cant Hooks, Clip Clasp, "Blue Line" Finish..... 7/8 doz \$14.00  
Cant Hooks, Clip Clasp, Common Finish..... 7/8 doz \$12.00  
Hand Spikes..... 7/8 doz 6 ft., \$15.00; 8 ft., \$20.00  
Pike Poles, Pike & Hook, 7/8 doz, 15 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.00; 18 ft., \$17.00; 20 ft., \$21.50.  
Pike Poles, Pike only, 7/8 doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.  
Pike Poles, not ironed, 7/8 doz, 12 ft., \$8.00; 14 ft., \$9.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00.  
Setting Poles, 7/8 doz, 12 ft., \$14.00; 14 ft., \$16.00; 16 ft., \$17.00.  
Swamp Hooks..... 7/8 doz \$18.00

**Lustre—**  
Four-ounce Bottles..... 7/8 doz, \$1.75; 7/8 gross..... \$17.00

#### Mallets—

Hickory..... 20¢10¢20¢10¢10¢  
Lignumvite..... 20¢10¢20¢10¢10¢  
B. & L. Block Co., Hickory & L. V..... 30¢30¢10¢

#### Match Safes—

Dangerfield's Self-Igniting..... 7/8 doz \$1.50

#### Mastocks, Regular list..... 50¢10¢5¢60¢

#### Meat Cutters—

Dixon's 7/8 doz..... 40¢25¢  
Nos..... 1 2 3 \$14.00 \$17.00 \$20.00  
Woodruff's 7/8 doz..... 100 150 \$15.00 \$18.00

Champion 7/8 doz..... 40¢25¢  
Nos..... 200 300 400 \$22.00 \$27.00 \$40.00

Hales Pattern 7/8 doz..... 70¢70¢5¢  
Nos..... 11 12 13 \$27.00 \$33.00 \$45.00

American..... 30¢  
Nos..... 1 2 3 4 B \$5 \$7 \$10 \$25 \$50 \$60

Enterprise..... 10 12 22 32 42  
Each..... \$3 \$2.50 \$4 \$6 \$15

Pennsylvania..... 40¢10¢  
Nos..... 1 2 3 00  
7/8 doz..... \$24.00 \$28.00 \$36.00 \$38.00

Miles' Challenge 7/8 doz..... 45¢45¢10¢  
Nos..... 1 2 \$22.00 \$30.00 \$40.00

Home No. 1..... 7/8 doz, \$26.00, 55¢10¢  
Draw Cut, each:  
Nos. 5 2 6 8 \$50 \$75 \$80 \$325..... 20¢25¢

Beef Shavers (Enterprise)..... 20¢10¢30¢  
Chadborn's Smoked Beef Cutter, 7/8 doz..... \$66.00

#### Mining Knives—

Am. (2d quality), 7/8 gr, 15 blade, 7/8; 2 blades, 12; 3 blades, \$18..... net  
Lothrop's..... 20¢10¢  
Smith's, 7/8 doz, Single, \$2.00; Double, \$3..... 40¢45¢  
Knapp & Cowles..... 50¢10¢30¢  
Buffalo Adjustable..... 7/8 doz \$3.00, 7/8

**Melasses Gates—**  
 Stebbin's Pat. 70¢ 70¢ 71¢  
 Stebbin's Genuine 60¢ 10¢ 10¢  
 Stebbin's Tinned Ends 40¢ 10¢  
 Chase's Hard Metal 50¢ 10¢  
 Bush's 70¢ 70¢ 10¢  
 Lincoln's Pattern 70¢ 70¢ 10¢  
 Weed's 20¢ 10¢  
 Boss, 7¢ doz:  
 Nos. 1, 7; No. 2, 8; No. 3, 9; No. 4  
 10. 60¢ 10¢ 10¢  
**Money Drawers—** 7¢ doz, \$18¢ 20¢  
**Muzzles—**  
 Safety 7¢ doz, \$3.00, 25¢  
**Nails, see Trade Report.**  
 Wire Nails, Paped.  
 Card June 1, '89, base 22.40¢ \$2.50  
 Tack Mfrs' list 70¢ 10¢  
 Wire Nails, Standard Penny.  
 Card June 1, '89, base 22.40¢ \$2.50  
**Nail Puller—**  
 Curtis Hammer 7¢ doz \$9.00  
 Giant, No. 1 7¢ doz \$30.00, 10¢  
 Pelican 7¢ doz, \$9.00, 25¢  
 Boss 7¢ doz, \$30.00, 30¢  
 Lightning 7¢ doz \$21.00  
**Nail Sets—**  
 Square 7¢ gr., \$4.00¢ \$4.25  
 Round 7¢ gr., \$3.25  
 Cannon's Diamond Point 7¢ gr., \$12.20¢  
**Nut Crackers—**  
 Table (H. & B. Mfg. Co.) 40¢  
 Blake's Pattern 7¢ doz \$3.00, 10¢  
 Turner & Seymour Mfg. Co. 50¢  
**Nuts—**  
 Nuts, off list Jan. 1, 1888: Square, Hex.  
 Hot Pressed 5.4¢ 5.5¢  
 Cold Punched 5.4¢ 5.5¢  
 In lots less than 100 lb, 7¢, add 1/4¢; 1-b  
 boxes, add 1¢ to list.  
**Oakum—**  
 Government 7¢ 7¢ 8¢  
 U. S. Navy 7¢ 7¢ 7¢  
 Navy 7¢ 7¢ 7¢  
**Oilers—**  
 Zinc and Tin 65¢ 65¢ 10¢  
 Brass and Copper 60¢ 10¢ 10¢ 10¢  
 Malleable, Hammer's Improved, No. 1.  
 \$3.00; No. 2, \$4.00; No. 3, \$4.40 7¢ doz.  
 10¢ 10¢ 10¢  
 Malleable, Hammer's, Old Pattern, same  
 list 40¢  
 Prior's Pat. or "Paragon" Brass 60¢ 10¢ 10¢  
 Prior's Pat. or "Paragon" Zinc 60¢  
 Olmstead's Tin and Zinc 60¢  
 Olmstead's Brass and Copper 60¢  
 Broughton's Zinc 60¢  
 Broughton's Brass 60¢  
**Packing, Steam—**  
 Rubber—  
 Standard 60¢ 10¢ 60¢ 10¢ 10¢  
 Extra 50¢ 10¢ 60¢  
 N. Y. B. & P. Co., Standard 50¢ 10¢ 5¢  
 N. Y. B. & P. Co., Empire 70¢  
 N. Y. B. & P. Co., Salamander 7¢ 65¢, 30¢  
 7¢ 30¢, 35¢  
 Jenkins' Standard 7¢ 30¢, 35¢  
**Miscellaneous—**  
 American Packing 10¢ 11¢ 7¢  
 Russia Packing 14¢ 7¢  
 Italian Packing 15¢ 14¢ 7¢  
 Cotton Packing 15¢ 17¢ 7¢  
 Jute 7¢ 8¢ 7¢  
**Padlocks—**  
 See Locks.  
**Pails—**  
 Galvanized Iron—  
 Quarts 10 12 14  
 Hills Light Weight, 7¢ doz, \$3.75 3.00 3.25  
 Hills Heavy Weight, 7¢ doz, 3.00 3.25 3.75  
 Whiting's 2.75 3.00 3.25  
 Sidney Shephard & Co. 2.80 3.00 3.40  
 Iron Clad 2.75 3.00 3.25  
 Fire Buckets 2.75 3.25 3.50  
 Buckets, see Well Buckets.  
**Indurated Fibre Ware—**  
 Star Pails, 12 qt., per doz. \$4.50 \$4.50  
 Fire, Stable and Milk, 14 qt., 7¢ doz \$5.85  
**Standard Fibre Ware—**  
 Plain, Dec'd  
 Water Pails, 12 qt., per doz. \$4.00 \$4.50  
 Dairy Pails, 14 qt., per doz. 4.50 5.00  
 Fire Pails, No. 1, 12 qt. per doz. 5.00  
 Fire Pails, No. 2, 14 qt. per doz. 4.50  
**Pencils—**  
 Railroad or Adze Eye, 5 to 6, \$12.00;  
 6 to 7, \$13.00. 50¢ 10¢ 25¢ 60¢  
**Picture Nails—**  
 Brass Head, Sargent's list 50¢ 10¢ 10¢  
 Brass Head, Combination list 50¢ 10¢  
 Porcelain Head, Sargent's list 50¢ 10¢ 10¢  
 Porcelain Head, Combination list 40¢ 10¢  
 Niles' Patent 40¢  
**Pinking Irons—** 7¢ doz 65¢ net  
**Pipe, Wrought Iron—**  
 List March 23, 1887.  
 14 and under, Plain 52¢ 45¢  
 14 and under, Galvanized 45¢  
 14 and over, Plain 65¢  
 14 and over, Galvanized 52¢  
 Boiler Tubes, Iron.  
 14 and under 55¢  
 2 in. and larger 60¢  
**Planes and Plane Irons—**  
 Wood Planes—  
 Molding 50¢ 25¢ 50¢ 10¢  
 Bench, First Quality 60¢ 80¢ 5¢  
 Bench, Second Quality 60¢ 10¢ 80¢ 10¢ 10¢  
 Bailey's (Stanley R. & L. Co.) 40¢ 10¢  
 Iron Planes—  
 Bailey's (Stanley R. & L. Co.) 40¢ 10¢  
 Miscellaneous Planes (Stanley R. & L.  
 Co.) 20¢ 10¢  
 Victor Planes (Stanley R. & L. Co.) 20¢ 10¢  
 Steer's Iron Planes 35¢ 35¢ 5¢  
 Meriden Mail Iron Co.'s 30¢ 10¢ 30¢ 10¢ 10¢  
 Davis's Iron Planes 30¢ 10¢ 30¢ 10¢ 10¢

Birmingham Plane Co. 50¢ 50¢ 5¢  
 Gage Tool Co.'s Self-Setting 20¢ 10¢  
 Chaplin's Iron Planes 40¢ 10¢ 10¢  
 Sargent's 30¢ 10¢ 30¢ 10¢ 10¢  
**Plane Irons—**  
 Plane Irons 20¢ 10¢  
 Plane Irons, Butcher's 50¢ 50¢ 25¢ to 2  
 Plane Irons, Buck Bros 30¢  
 Plane Irons, Auburn Tool Co., "This-  
 tie" 40¢  
 Sandusky Tool Co.:  
 Single and Cut 30¢  
 Double 40¢  
 L. & J. White 25¢  
**Pliers and Nippers—**  
 Button's Patent 30¢ 10¢ 40¢  
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.  
 \$21.00 7¢ doz 20¢ 10¢ 35¢  
 Humason & Beckley Mfg. Co. 50¢ 50¢ 10¢  
 Gas Pliers 60¢  
 Gas Pliers, Custar's Nickel Plated 60¢ 5¢  
 Eureka Pliers and Nippers 40¢  
 Russell's Parallel 25¢  
 P. S. & W. Cast Steel 60¢  
 P. S. & W. Tinnars' Cutting Nippers, add 5¢ dis.  
 10¢  
 Carew's Pat. Wire Cutters 20¢  
 Morrill's Parallel 7¢ doz, \$12.00 30¢ 5¢  
 Cronk's 8 in., \$15.00; 10 in. \$21.00.  
 40¢ 40¢ 5¢  
**Plumbs and Levels—**  
 Regular List 70¢ 10¢ 70¢ 10¢ 10¢  
 Davison's 45¢ 10¢  
 Pocket Levels 70¢ 10¢ 70¢ 10¢ 10¢  
 Davis Iron Levels 30¢  
 Davis Incl.ometers 10¢ 10¢  
**Polish, Metal.**  
 Prestoline 20¢ 10¢  
 Krestoline Paste 35¢  
 Gaston's Silver Compound 35¢  
**Peaks, Animal—**  
 Bishop's I. X. L. 7¢ doz \$5.50  
 Bishop's O. K. 7¢ doz \$5.50  
 Bishop's Pioneer 7¢ doz \$3.75  
 Bishop's American 7¢ doz \$3.00  
**Peppers, Corn—**  
 Round or Square, 1 qt. 7¢ gr \$12.00 15.00  
 Round or Square, 2 qt. 7¢ gr \$25.00 25.00  
**Post Hole and Tree Augers**  
 and Diggers—  
 Samson Post Hole Digger, 7¢ doz \$36.00.  
 25¢ 10¢  
 Fletcher Post Hole Augers, 7¢ doz \$30. 20¢  
 Eureka Diggers 7¢ doz \$16.00 17.00  
 Lead's 7¢ doz \$3.00 3.00  
 Vaughan's Post Hole Auger 7¢ doz \$14.00  
 60¢ 10¢ 10¢  
 Kohler's Little Giant 7¢ doz \$18.00  
 Kohler's Hercules 7¢ doz \$15.00  
 Kohler's New Champion 7¢ doz \$30.00  
 Schneider 7¢ doz \$18.00  
 Ryan's Post Hole Diggers 7¢ doz \$24.00  
 Cronk's Post Bars 7¢ doz \$30.00.  
 50¢ 10¢ 50¢ 10¢  
 Gibbs Post Hole Digger 7¢ doz \$30.00, 40¢  
 Imperial 7¢ doz, \$15. 45¢  
**Potato Parers—**  
 White Mountain 7¢ doz \$5.00 5.50  
 Antrim Combination 7¢ doz \$5.00  
 Hooser 7¢ doz \$15.50  
**Pruning Hooks and Shears—**  
 Diston's Combined Pruning Hook and  
 Saw 7¢ doz \$15.00, 20¢ 10¢  
 Diston's Pruning Hook, 7¢ doz \$12.00.  
 20¢ 10¢  
 E. S. Lee & Co.'s Pruning Tools 40¢  
 Pruning Shears, Henry's Pat. 7¢ doz  
 \$3.75 4.00 net  
 Henry's Pruning Shears, 7¢ doz \$4.25 4.50 net  
 Wheeler, M. & C. Co.'s Combination,  
 7¢ doz \$12.00, 20¢  
 Dunlap's Saw and Chisel, 7¢ doz \$5.50, 50¢  
 J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25  
**Pulleys—**  
 Hot House, Awning, &c. 60¢ 10¢  
 Japanned Screw 60¢ 10¢  
 Brass Screw 60¢ 10¢  
 Japanned Side 60¢ 10¢  
 Japanned Clothes Line 60¢ 10¢  
 Empire Sash Pulley 55¢ 60¢  
 Moore's Sash, Anti-Friction 50¢  
 Hay Fork, Solid Eye, \$4.00; Swivel,  
 \$4.50 50¢ 10¢ 50¢ 10¢ 50¢  
 Hay Fork, "Anti-Friction," 5 in. Solid,  
 \$5.70 50¢  
 Hay Fork, "F" Common and Pat.  
 Bushed 20¢  
 Hay Fork, Tarbox Pat. Iron 20¢  
 Hay Fork, Reed's Self-Lubricating 20¢  
 Shade Rack 45¢  
 Tackle Blocks, see Blocks  
 Moore's Anti-Friction 5 in. Wheel, 7¢ doz  
 \$12.00 40¢  
**Pumps—**  
 Clatern, Best Makers 50¢ 10¢ 60¢  
 Pitcher Spout, Best Makers 60¢ 10¢ 60¢  
 Pitcher Spout, Cheaper Goods 70¢ 25¢  
**Punches—**  
 Saddlers' or Drive, good, 7¢ doz 60¢ 65¢  
 Bemis & Call Co.'s Cast Steel Drive 60¢ 65¢  
 Bemis & Call Co.'s Springfield Socket 50¢ 55¢  
 Spring, good quality 7¢ doz \$2.50 2.60  
 Spring, Leach's Pat. 15¢  
 Bemis & Call Co.'s Spring and Check 40¢  
 Solid Tinnars' 7¢ doz \$1.44, 55¢  
 Tinnars' Hollow Punches 20¢ 25¢  
 Rice Hand Punches 15¢  
 Avery's Revolving 15¢  
 Avery's Saw-Set and Punch. See Saw Sets.  
**Rail—**  
 Sliding Door, Wrt' Brass, 7¢ 35¢ 15¢  
 Terry's Wrought Iron, 7¢ foot 70¢ 70¢ 5¢  
 Sliding Door, Iron, Painted, 7¢ foot 4¢, 40¢  
 Barn Door, Light In. 3¢ 3¢  
 Per 100 feet. \$2.00 2.50 3.10, 10¢  
 B. D. for N. E. Hangers—  
 Small, Med. Large.  
 Per 100 feet. \$2.15 2.70 3.25, net  
 Terry's Wrought Iron, 7¢ foot 70¢ 70¢ 5¢  
 Victor Track Rail, 7¢ 7¢ foot 60¢ 25¢  
 Carrier Steel Rail, 7¢ foot 45¢  
 Moore's Wrought Iron 25¢  
**Rakes—**  
 Cast Steel, Association goods 65¢  
 Cast Steel, outside goods 60¢ 10¢ 70¢  
 Malleable 70¢ 70¢ 5¢  
 Gibbs Lawn Rake \$12.00, 50¢ 45¢  
 Canton Lawn Rake \$9.00, 50¢ 10¢  
 Ft. Madison Prize Bow Rake and Per-  
 less 65¢

Fort Madison Steel Tooth Lawn Rake,  
 \$6.00. 25¢  
**Razors—**  
 J. B. Torrey Razor Co. 20¢  
 Wostenholme and Butcher, \$10.00 to 2.  
 10¢  
**Razor Straps—**  
 Genuine Emerson 60¢ 60¢ 5¢  
 Imitation 7¢ doz \$2.00, 20¢ 10¢ 5¢  
 Torrey's 20¢  
 Badger's Belt and Com. 7¢ doz \$2.00  
 Lamont Combination 7¢ doz \$4.00  
**Rivets and Burrs—**  
 Iron, list Nov. 17, '87. 50¢  
 Copper 50¢ 10¢ 60¢  
**Rivet Sets—** 50¢ 10¢  
**Rods—**  
 Stair, Brass 25¢ 25¢  
 Stair, Black Walnut 7¢ doz 40¢  
**Rollers—**  
 Barn Door, Sargent's list 60¢ 10¢ 10¢  
 Acme Moore's Anti-Friction 55¢  
 Union Barn Door Roller 70¢  
**Rope—**  
 Manufacturers' prices for large lots:  
 Manila 1/4 in. and larger 7¢ 15¢  
 Manila 1/4 in. 7¢ 15¢  
 Manila 1/4 and 5-16 in. 7¢ 15¢  
 Manila Tarred Rope 7¢ 15¢  
 Manila Hay Rope 7¢ 15¢  
 Sisal 1/4 inch and larger 7¢ 12¢  
 Sisal 1/4 in. 7¢ 12¢  
 Sisal 1/4 and 5-16 in. 7¢ 12¢  
 Sisal Hay Rope 7¢ 12¢  
 Sisal Tarred Rope 7¢ 12¢  
 Sisal Medium Lake Yarn 7¢ 11¢  
 Cotton Rope 7¢ 15¢ 15¢ net  
 Jute Rope 7¢ 8¢  
**Rules—**  
 Boxwood 30¢ 10¢ 10¢ 80¢ 10¢ 10¢ 5¢  
 Ivory 50¢ 50¢ 10¢  
 Starrett's Rules and Straight Edges,  
 Steel 25¢ 10¢  
**Sad Irons—**  
 From 4 to 10, at factory 7¢ 100 lb.  
 Self-Heating 7¢ doz \$2.40 2.55  
 Self-Heating, Tailors' 7¢ doz \$18.00 net  
 Gleason's Shield and Toilet 25¢  
 Mrs. Pott's Irons 40¢ 40¢ 10¢  
 Enterprise Sash Irons 40¢  
 Combined Fluter and Sad Iron, 7¢ doz  
 \$3.00 15¢  
 Fox Reversible, Self-Fluter 7¢ doz \$24.00  
 Chinese Laundry (N.E. Butt Co.) 8¢ 15¢  
 New England 5¢ 15¢  
 Mahony's Troy Pol. Irons 25¢  
 Sensible 30¢ 20¢ 5¢  
 National Self-Heating 30¢  
**Sand and Emery Paper and**  
**Cloth—**  
 List April 12, 1888. 50¢ 50¢ 10¢  
 Sibley's Emery and Crocus Cloth 30¢  
**Sash Cord—**  
 Common 7¢ 10¢ 11¢  
 Patent, good quality 7¢ 15¢ 15¢  
 White Cotton Braided, fair 7¢ 25¢ 25¢  
 Common Russia Sash 7¢ 13¢ 13¢  
 Patent 7¢ 15¢  
 Cable Laid Italian Sash 7¢ 25¢ 25¢  
 India Cable Laid 7¢ 13¢  
**Silver Lake—**  
 A Quality, white, 50¢ 10¢ 10¢ 5¢  
 A Quality, Drab, 55¢ 10¢ 10¢ 5¢  
 B Quality, white, 50¢ 20¢ 10¢ 5¢  
 B Quality, Drab, 55¢ 20¢ 10¢ 5¢  
 C Quality, white (only) 25¢ 10¢ 25¢  
 Sylvan Spring, Extra Braided, white, 8¢  
 Semper Idem, Braided, white, 8¢  
 Egyptian, India Hemp, Braided, 8¢  
**Sargon—**  
 Braided, White Cotton, 50¢ 30¢ 30¢ 5¢  
 Braided, Drab Cotton, 55¢ 30¢ 30¢ 5¢  
 Braided, Italian Hemp, 55¢ 30¢ 30¢ 5¢  
 Braided, Linen, 80¢ 30¢ 30¢ 5¢  
**Sash Locks—**  
 Clark's, No. 1, \$10; No. 2, \$8 7¢ gr. 32¢ 45¢  
 Ferguson's 35¢ 45¢  
 Morris and Triumph, list Aug. 16, 1886,  
 60¢ 25¢  
 Victor 60¢ 10¢ 25¢  
 Walker's 10¢  
 Atwood Mfg. Co. 25¢ 25¢ 10¢  
 Beeding 60¢ 10¢ 60¢ 10¢ 10¢  
 Hammond's Window Springs 40¢  
 Common Sense, Jap'd, Cop'd and  
 Br'd 7¢ gr \$4.00  
 Common Sense, Nickel Plated  
 7¢ gr \$10.00  
**Universal—**  
 Kempshall's Gravity 60¢  
 Kempshall's Model 60¢ 60¢ 10¢  
 Corbin's Daisy, list Feb. 15, 1888 70¢  
 Payson's Perfect 60¢ 60¢ 10¢  
 Huginin's Sash Balances 25¢ 25¢ 25¢  
 Huginin's New Sash Locks 25¢ 25¢ 25¢  
 Stoddard's "Practical" 60¢ 60¢ 10¢  
 Lee's Patent 60¢ 60¢ 10¢  
 Liesche's, Nos. 100 and 110, 7¢ gr 8¢;  
 105, \$10.00 30¢ 10¢  
 Davis, Bronze, Barnes Mfg. Co. 50¢  
 Champion Safety, list March 1, 1888  
 55¢ 55¢ 5¢  
 Security 70¢  
 Buckeye 7¢ gr \$4.80  
**Sash Weights—**  
 Solid Eyes 7¢ ton \$22.00  
**Sausage Stuffers or Fillers—**  
 Milas' "Challenge," 7¢ doz \$20, 50¢ 50¢ 5¢  
 Perry 7¢ doz, No. 1, \$15.00; No. 0,  
 \$22.00 50¢ 50¢ 5¢  
 Drew Cut No. 4, each \$30.00. 20¢  
 Enterprise Mfg. Co. 20¢ 10¢ 30¢  
 Silver's 40¢ 10¢  
**Saws—**  
 Diston's Cir-  
 cular, 45¢ 45¢ 5¢ Extras some-  
 times given  
 Diston's Cross 45¢ 45¢ 5¢  
 Cut, 45¢ 45¢ 5¢ by jobbers.  
 Diston's Hand 25¢ 25¢ 5¢  
 Atkins' Circular Shingle and Heading  
 50¢ 10¢

Atkins' Silver Steel Diamond X Cuts  
 70¢  
 Atkins' Special Steel Dexter X Cuts  
 70¢  
 Atkins' Special Steel Diamond X Cuts  
 70¢  
 Atkins' Champion and Electric Tooth  
 X Cuts 70¢  
 Atkins' Hollow Back X Cuts 70¢  
 Atkins' Mulay, Mill and Drag 40¢ 10¢  
 Atkins' One-Man Saw, with handles  
 70¢  
 W. M. & C. Hand 30¢ 5¢ 30¢ 10¢  
 W. M. & C. Champion X Cuts, Regu-  
 lar 70¢  
 W. M. & C. X Cuts, Thin Back 70¢  
 Peace Circular and Mill 70¢  
 Peace Hand Panel and Rip 45¢ 10¢  
 Peace Cross Cuts, Standard 70¢  
 Peace Cross Cuts, Thin Back 70¢  
 Richardson's Circular and Mill 45¢ 45¢ 10¢  
 Richardson's X Cuts,  
 No. 1, 30¢; No. 2, 27¢; No. 3, 24¢  
**Hack Saws—**  
 Griffin's, complete 40¢ 10¢ 50¢  
 Griffin's Hack Saw, Blades 40¢ 10¢ 50¢  
 Star Hack Saws and Blades 25¢  
 Diamond Hack Saws and Blades 25¢  
 Eureka and Crescent 25¢  
**Saw Frames—**  
 White Vermont 7¢ gro \$9.00 10.00  
 Red, Polished and Varnished 7¢ doz  
 \$1.50, 25¢  
**Saw Sets—**  
 Stillman's Genuine 7¢ doz \$5.00 7.75,  
 40¢ 25¢  
 Stillman's Imita. 7¢ doz \$3.50 5.25,  
 40¢ 25¢  
 Common Lever 7¢ doz \$2.00, 40¢ 5¢  
 Morrill's No. 1, \$15.00; Nos. 2 & 4, \$24.00.  
 40¢ 10¢ 50¢  
 Leach's, No. 0, \$8.00; No. 1, \$15, 15¢ 20¢  
 Nash's, 20¢ 10¢ 20¢ 10¢ 10¢  
 Hammer, Hotchkiss \$5.50, 10¢  
 Hammer, Bemis & Call Co.'s new Pat.  
 30¢ 25¢  
 Bemis & Call Co.'s Lever and Spring  
 Hammer 30¢ 25¢  
 Bemis & Call Co.'s Plate 10¢  
 Bemis & Call Co.'s Cross Cut 12¢ 4¢  
 Aiken's Genuine \$13.00, 50¢ 10¢  
 Aiken's Imitation \$7.00, 55¢ 5¢  
 Hart's Pat. Lever 20¢  
 Diston's Star, \$9, No. 15, \$5.50, 20¢  
 10¢ 20¢ 10¢ 10¢  
 Atkin's Lever, 7¢ doz No. 1, \$6.00, No. 2,  
 \$8.00 25¢  
 Atkin's Criterion 7¢ doz \$7.50  
 Croissant (Keller), No. 1, \$15.00; No. 2,  
 \$24.00 40¢ 10¢  
 Avery's Saw Set and Punch 50¢  
 Am. Tool Co.'s Superior 7¢ doz \$15, 50¢  
**Saw Tools—**  
 Atkins' Perfection 7¢ doz \$15.00  
 Atkins' Excelsior 7¢ doz \$6.00  
 Atkins' Giant 7¢ doz \$4.00  
**Scales—**  
 Hatch, Counter, No. 171, good quality,  
 7¢ doz \$21.00  
 Hatch, Tea, No. 161 7¢ doz \$9.75 9.00  
 Union Platform, Plain 20¢ 10¢ 20¢  
 Union Platform, Striped, 20¢ 10¢ 20¢  
 Chatillon's Grocers' Trip Scales 20¢  
 Chatillon's Eureka 25¢  
 Chatillon's Favorite 40¢  
 Family, Turnbills 30¢ 30¢ 10¢  
 Eureka Bros. Platform 40¢  
**Scale Beams—**  
 Scale Beams, list Jan. 12, '82 50¢ 10¢  
 50¢ 10¢ 5¢  
 Chatillon's No. 1 40¢  
 Chatillon's No. 2 50¢  
**Scrapers—**  
 Adjustable Box Scraper (S. R. & L. Co.)  
 \$5.50 30¢ 10¢  
 Box, 1 Handle 7¢ doz \$4.00, 10¢  
 Box, 2 Handle 7¢ doz \$5.00, 10¢  
 Dedance Box and Ship 20¢ 10¢  
 Foot 50¢ 10¢ 60¢  
 Ship, Common 7¢ doz \$3.50 net  
 Ship, R. I. Tool Co. 10¢  
**Screen Window and Door**  
**Frames—**  
 Porter's Pat. Window and Door Frame,  
 35¢ 45¢ 10¢  
 Warner's Screen Corner Irons 35¢ 45¢  
 35¢ 45¢ 10¢  
 Stearns' Frames and Corners 25¢ 25¢ 10¢  
**Screw Drivers—**  
 Douglas Mfg. Co. 20¢ 10¢ 10¢  
 Diston's 45¢ 10¢  
 Diston's Pat. Excelsior 45¢ 10¢  
 Buck Bros. 30¢  
 Stanley R. & L. Co.'s  
 Varnished Handles 65¢ 10¢  
 Black Handles 60¢ 10¢  
 Sargent & Co.'s  
 No. 1 Forged Blade 60¢ 10¢ 10¢  
 Nos. 20, 30 and 60 60¢ 10¢ 10¢  
 Knapp & Cowles' No. 1 60¢ 20¢ 70¢  
 No. 1 Extra 60¢ 60¢ 10¢  
 Nos. 00 & 4 50¢ 50¢ 10¢ 5¢  
 Stearns' 25¢ 10¢ 5¢  
 Gay & Parsons 35¢  
 Champion 25¢ 10¢  
 Clark's Pat. 30¢ 35¢  
 Crawford's Adjustable 30¢  
 Ellrich's Socket and Ratchet 25¢ 25¢ 10¢  
 Allard's Spiral, new list 25¢  
 Kolb's Common Sense 7¢ doz \$6.00, 25¢ 10¢  
 Syracuse Screw-Drive Bits 30¢ 30¢ 5¢  
 Screw Driver Bits 70¢ 50¢ 75¢  
 Screw-Drive Bits, Parr's 7¢ doz \$6.25  
 Fray's Hol. Hdle. Sets, No. 3, \$12.00,  
 25¢ 25¢ 10¢  
 P. D. & Co.'s all Steel 50¢  
**Screws—**  
 Wood Screws—list March 1, 1889  
 Flat Head Iron 50¢  
 Round Head Iron 40¢  
 Flat Head Brass 45¢  
 Round Head Brass 35¢  
 Flat Head Bronze 45¢  
 Round Head Bronze 35¢  
 Extra 5¢ 10¢  
 often given



<b>Machine-</b>	
Flat Head, Iron.....	55%
Round Head, Iron.....	50%
<b>Bench and Hand-</b>	
Bench, Iron.....	55&10&55&10&10%
Bench, Wood, Beech.....	20&10%
Bench, Wood, Hickory.....	25&10&25&10&5%
Hand, Wood.....	75&10%
Lag, Blunt Point.....	75%
Coch and Lag, Gimlet Point.....	75%
Bed.....	25&5%
Hand Rail, Sargent's.....	60&10&10%
Hand Rail, H. & B. Mfg. Co.....	70&10&75%
Hand Rail, Am. Screw Co.....	75%
Jack Screws, Millers Falls list.....	50&50&5%
Jack Screws, P. S. & W.....	35%
Jack Screws, Sargent.....	60&10&60&10&5%
Jack Screws, Stearns.....	40&40&10%
<b>Scroll Saws-</b>	
Lester, complete, \$10.00.....	25%
Rogers, complete, \$4.00.....	25%
Barnes' Builders' and Cabinet Makers'.....	25%
Barnes' Scroll Saw Blades.....	35%
<b>Scythe Snaths.....</b>	<b>50&amp;2%</b>
<b>Shears-</b>	
American (Cast) Iron.....	75&10&75&10&5%
Pruning..... See Pruning Hooks and Shears	
Barnard's Lamp Trimmers.....	\$ do \$3.75
Tinners.....	20&2%
Seymour's, List, Dec. 1881.....	60&10&10&60&10&10&5%
Heinrich's, List, Dec. 1881.....	60&10&10&60&10&10&5%
Heinrich's Tailor's Shears.....	80&80&10%
First quality C. S. Trimmers.....	80&80&10%
Second quality C. S. Trimmers.....	80&10&80&10&10%
Acme Cast Shears.....	10&10%
Diamond Cast Shears.....	10%
Clippers.....	10&10%
Victor Cast Shears.....	75&10&75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....	40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....	80%
Clausen Shear Co., Japanned.....	70%
Clausen Shear Co., Nickleled, same list.....	60%
<b>Sheaves-</b>	
<b>Sliding Door-</b>	
M. W. Co., list July, 1888.....	50&10&60&5%
R. & E., list Dec. 18, 1885.....	55&20%
Corbin's list.....	60&10&2%
Patent Roller.....	75%
Patent Roller, Hatfield's.....	60&2%
Russell's Anti-Friction, list Dec. 18, 1885.....	60&2%
Moore's Anti-Friction.....	60%
<b>Sliding Shutter-</b>	
R. & E., list Dec. 18, 1885.....	60&10&2%
Sargent's list.....	60&10%
Reading list.....	60&10&10%
<b>Ship Tools-</b>	
L. & I. J. White.....	20&5%
Albertson Mfg. Co.....	25%
<b>Shoes, Horse, Mule, &amp;c.-</b>	
<b>Horse-</b>	
Burden's, Perkins', Phoenix, at factory.....	\$4.00
<b>Mule-</b>	
Add \$1 per keg to above prices.	
<b>Ox Wrought-</b>	
Ton lots.....	\$ 9 94
1000 lb lots.....	\$ 9 94
500 lb lots.....	\$ 9 94
<b>Shot-</b>	
(Eastern prices 2 1/2 off, cash, 5 days.)	
Drop, 1/2 bag, 25 lb.....	\$1.16
Drop, 1/2 bag, 5 lb.....	.39
Buck and Chilled, 1/2 bag.....	1.41
Buck and Chilled, 1/2 bag.....	.34
<b>Shovels and Spades-</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20%
NOTE: Jobbers frequently give 5% extra on above.	
Griffith's Black Iron.....	50&10%
Griffith's C. S. & R. R. Goods.....	20%
Old Colony (Sanford Fork & Tool Co.).....	20%
St. Louis Shovel Co.....	20&20&7%
Huasey, Binns & Co.....	15&25%
Hubbard & Co.....	20&20&7%
Lehigh Mfg. Co.....	50&10%
Payne Pettibone & Son, list January, 1886.....	30%
Remington's (Lowman's) Pat.....	30&10&40%
Rowland's, Black Iron.....	50&10%
Rowland's Steel.....	60&5&60&10%
<b>Shovels and Tongs-</b>	
Iron Head.....	60&10&60&10&5%
Brass Head.....	60&10&10%
<b>Skeins, Thimble-</b>	
Western list.....	75&5&75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.....	30%
Coldbrookdale Iron Co.....	50&10%
Utica P. S. T. Skeins.....	60%
Utica Turned and Fitted.....	35%
<b>Sieves-</b>	
Buffalo Metallic, S. S. & Co.....	50&25&10%
Shaker (Barber's Pat.) Flour Sifters.....	\$ do \$2.00
Electric.....	\$ gr \$18.00
Hunter's.....	\$ gr \$21.00
Smith's Adjustable Sifters.....	\$ do \$2.00
Smith's Adjustable Milk Strainer.....	\$ do \$2.00
Smith's Adjustable T. & C. Strainer.....	\$ do \$1.25
<b>Sieves, Wooden Rim-</b>	
Mesh 18, Nested, \$ do.....	70¢
Mesh 20, Nested, \$ do.....	85¢
Mesh 24, Nested, \$ do.....	\$1.00
Mesh 24, Nested, \$ do.....	1.10
<b>Slates-</b>	
School, by case.....	40%
<b>Snaps, Harness, &amp;c.-</b>	
Anchor (T. & S. Mfg. Co.).....	65%
Pitch's (Bristol).....	50&10%
Hotchkiss.....	10%
Andrews.....	50%
Sargent's Patent Guarded.....	70&10&10%
German, new list.....	40&10%
Covert, New Patent.....	50&5&2%
Covert, New R. E.....	60&2%
Covered Spring.....	60&10&10%
<b>Soldering Irons-</b>	
Covert's Adjustable, list Jan. 1, 1888.....	35&2%

<b>Spoke Shaves-</b>	
Iron.....	45%
Wood.....	80%
Bailey's (Stanley R. & L. Co.).....	40&10%
Stearns.....	20&10&30%
<b>Spoke Trimmers-</b>	
Bonney's.....	\$ do \$10.00, 50%
Stearns.....	20&10%
Ives, No. 1, \$15.00; No. 2, \$12.00 \$ do.....	55&10%
Douglas.....	\$ do \$9.00, 20%
<b>Spoons and Forks-</b>	
<b>Tinned Iron-</b>	
Basting, Cen. Stamp. Co's list.....	70&10%
Solid Table and Tea, Cen. Stamp. Co's list.....	70&10%
Buffalo S. S. & Co.....	33&2%
<b>Stuber-Plated</b> (4 mos. or 5% cash 30 days)	
Mariden Brit. Co., Rogers.....	50%
C. Rogers & Bros.....	50%
Rogers & Bro.....	50%
Reed & Barton.....	50%
Wm. Rogers Mfg. Co.....	50&10&60%
Simpson, Hall, Miller & Co.....	50&10%
Holmes & Edwards Silver Co.....	50&10%
L. Boardman & Son.....	50&10%
<b>Miscellaneous.</b>	
Holmes & Edwards Silver Co.....	50&10%
No. 87 Mexican Silver.....	50&10%
No. 30 Silver Metal.....	50&10%
No. 24 German Silver.....	50%
No. 50 Nickel Silver.....	50&10%
No. 49 Nickel Silver.....	50&10%
German Silver.....	50&50&5%
German Silver, Hall & Elton.....	50&5%
Nickle Silver.....	50&50&10&5%
Britannia.....	50%
Boardman's Nickel Silver.....	50%
Boardman's Britannia Spoons, case.....	50%
<b>Springs-</b>	
Elliptic, Concord, Platform and Half Scroll.....	60&60&2%
Chiff's Bolster Springs.....	25%
<b>Squares-</b>	
Steel and Iron.....	75&10&80%
Nickle-Plated.....	60&10&60&10%
Try Square and T Bevels.....	210%
Dixon's Try Square and T Bevels.....	45&10%
Winterbottom's Try and Miter.....	80&10%
Starrett's Micrometer Caliper Squares.....	25%
Avery's Flush Bevel Squares.....	40%
Avery's Bevel Protractor.....	50%
<b>Standard Fibre Ware-</b>	
	Per Dozen.
Wash-Basins, 10 1/2 in.....	\$2.00
Wash-Basins, 12 in.....	2.25
Keelers, 1 1/4 in.....	2.75
Cuspidors.....	4.00
Spittoons, "Daisy," 8 in.....	4.00
Peck Measure.....	4.00
Half-peck Measure.....	3.50
See also Pails.	
<b>Staples-</b>	
Fence Staples, Galvanized.....	Same price as Barb Wire
Fence Staples, Plain.....	See Trl. Rep.
<b>Steelyards.....</b>	<b>40&amp;10&amp;50%</b>
<b>Stocks and Dies-</b>	
Blacksmith's.....	30&5&30&10%
Waterford Goods.....	30&5&30&10%
Butterfield's Goods.....	30&5&30&10%
Lightning Screw Plate.....	25&30%
Beece's New Screw Plates.....	33&2&40%
<b>Stone-</b>	
Hindustan No. 1, 3/4; Aze. 3/4; Slips No. 1, 4 1/4.....	\$ 2 1/2
Sand Stone.....	\$ 19&20%
Washita Stone, Extra.....	\$ 14&15%
Washita Stone, No. 1.....	\$ 10&11%
Washita Stone, No. 2.....	\$ 10&11%
Washita Slips, No. 1, Extra.....	\$ 24&25%
Washita Slips, No. 1.....	\$ 24&25%
Arkansas Stone, No. 1, 4 to 6 in.....	\$ 1.50
Arkansas Stone, No. 1, 6 to 9 in.....	\$ 1.85
Turkey Oil Stone, 4 to 8 in.....	\$ 1.40
Turkey Slips.....	\$ 1.00
Lake Superior Chase.....	\$ 1.15
Lake Superior Slips, Chase.....	\$ 1.15
Seneca Stone, Red Paper Brand.....	\$ 1.20
Seneca Stone, High Rounds.....	\$ 2.00
Seneca Stone, Small Whets.....	\$ 2.00
<b>Stone Polish-</b>	
Joseph Dixon's.....	\$ gro \$6.00, 110%
Gem.....	\$ gro \$4.50, 10%
Gold Medal.....	\$ gro \$6.00, 25%
Mirror.....	\$ gro \$6.00, 1%
Lustr.....	\$ gro \$3.75
Ruby.....	\$ gro \$5.50
Rising Sun, 5 gro lots.....	\$ 5.00
Dixon's Plumbago.....	\$ 13.00
Boynston's Noon Day.....	\$ gro 10.00
Parlor Pride Stove Enamel.....	\$ gro 10.00
Yates' Liquid.....	\$ gal \$0.90, 80
Yates Standard Paste Polish, 10 lb cans.....	\$ 1.50
Jet Black.....	\$ gro \$3.50
Japanese.....	\$ gro \$3.50
Firestone.....	\$ gro \$3.50
Diamond O. K. Enamel.....	\$ gro \$19.00
Bonnell's Liquid Stove Polish.....	\$ gro \$9.00
Bonnell's Paste Stove Polish.....	\$ gro \$4.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....	12 1/2%
Black Jack Water Paste, 5 and 10 lb cans.....	12 1/2%
Nickle Plate Paste.....	\$ gro \$6.00
<b>Tacks, Brads, &amp;c.-</b>	
List, Jan. 2, 1888. (Note: Some manufacturers are selling Tacks at slightly higher prices than those named.)	
American Iron Carpet.....	80&80&5%
Steel Carpet.....	80&80&5%
Swedes Iron Carpet.....	80&80&5%
American Iron Cut.....	75&75&10%
Swedes Iron.....	75&75&10%
Swedes Iron, Upholsterers.....	75&10&75&10&5%
Tinned Swedes Iron.....	75&10&75&10&5%
Tinned Swedes Iron, Upholsterers.....	75&10&75&10&5%
Gimp and Lace.....	75&10&75&10&5%
Tinned Gimp and Lace.....	75&10&75&10&5%
Swedes Iron Trimmers.....	75&10&75&10&5%
Swedes Iron Bill Posters.....	75&10&75&10&5%
Swedes Iron Bill Posters.....	75&10&75&10&5%

<b>Swedes Steel (Swedes Iron price list)</b>	
Copper Tacks.....	50&10%
Copper Finishing, Trunk and Clout Nails.....	50&10%
Finishing Nails.....	70&10&70&10&10%
Trunk and Clout Nails.....	70&10&70&10&10%
Tinned Trunk and Clout Nails.....	70&10&70&10&10%
Basket Nails.....	70&10&70&10&10%
Common and Patent Brads.....	70&10&70&10%
Hungarian Nails.....	70&10&70&10&10%
Chair Nails.....	70&10&70&10&10%
Zinc Glaziers' Points.....	50&50&5%
Clear Box Nails.....	50&10&50&10&5%
Picture-Frame Points.....	50&10&50&10&5%
Looking-Glass Tacks.....	50&10&50&10&5%
Leathered Carpet.....	50&10&50&10&5%
Brush Tacks.....	50&10&50&10&5%
Shoe Finders, List Jan. 2, 1888.....	10&10&5%
<b>Lining and Saddle Nails, List Jan. 1, 1886:</b>	
Silvered.....	30&10&10%
Japanned.....	20&10&10%
Double-Pointed Tacks.....	85%
Wire Carpet Nails.....	50&10%
Wire Brads & Points, see Nails Wire.....	
Steel Wire Brads, R. & E. Mfg. Co's list.....	50&10%
<b>Tap Borers-</b>	
Common and Rind.....	20&10%
Ive's Tap Borers.....	33&2&5%
Enterprise Mfg. Co.....	30&10%
Clark's.....	33&2&3%
<b>Tapes, Measuring-</b>	
American.....	25&10%
Spring.....	40%
Chesterman's, Regular list.....	25&30%
<b>Thermometers-</b>	
Tin Case.....	80&80&10%
<b>Thimble Skeins-See Skeins.</b>	
<b>Ties, Bale-Steel</b>	
Standard Wire, list.....	50&10&5%
<b>Tinners' Shears, &amp;c.-</b>	
Shears and Snips (P. S. & W.).....	20&25%
Punches, see Punches	
Snips, J. Mallinson & Co.....	33&4%
<b>Tinware-</b>	
Stamped, Japanned and P/ed, list Jan. 20 1887.....	75&75&5%
<b>Tire Benders, Upsetters, &amp;c-</b>	
Stoddard's Lightning Tire Upsetters.....	15%
Detroit Perfected Tire Bender.....	15%
<b>Tobacco Cutters-</b>	
Champion.....	20&10&30%
Wood Bottom.....	\$ do \$5.00, 25%
All Iron.....	\$ do \$4.25
Nashua Lock Co's.....	\$ do \$18.00, 50&5%
Wilson's.....	\$ do \$24.55, 10%
Acme.....	\$ do \$20.00, 40%
<b>Transm Lifters-</b>	
Wollensak's.....	
Class 3 and 4, Bronzed Iron.....	50%
Class 3 and 4, Bronze Metal.....	25%
Class 3 and 4, Brass.....	35%
Skylight Lifters.....	35%
Crown, Eagle and Shield.....	50%
Reith's, list Jan. 1, 1887.....	50&10&2%
Bronze, Iron Rods.....	50&10&2%
Excelsior.....	50&10&2%
Shaw's.....	50&10%
Payson's Universal.....	40&40&10%
<b>Traps-</b>	
Game.....	35&40&5%
Newhouse.....	70&70&5%
Onedra Pattern.....	40&10&5%
Game, Blake's Patent.....	40&10&5%
<b>Mouse and Rat-</b>	
Mouse Wood Choker, \$ do \$1.10, 12 1/2%	
Mouse, Round Wire.....	\$ do \$1.50, 10%
Mouse, Cage Wire.....	\$ do \$2.50, 10%
Mouse, Catch-em-alive.....	\$ do \$2.50, 15%
Mouse, Bonanza.....	\$ gr \$10.00
Mouse, Delusion.....	\$ gr \$15.00
Rat, Decoy.....	\$ gr \$10.00, 10%
Ideal.....	\$ gr \$10.00
Cyclone.....	\$ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps.....	\$ do \$9.00
In full cases.....	\$ do \$7.50
<b>Trowels-</b>	
Lothrop's Brick and Plastering.....	25&25&5%
Reed's Brick and Plastering.....	25&25&10%
Dixon's Brick and Plastering.....	25%
Peace's Plastering.....	25%
Clement & Maynard's.....	20%
Rose's Brick.....	15&20%
Brade's Brick.....	25%
Worrall's Brick and Plastering.....	20%
Garden.....	70%
<b>Triers-</b>	
Butter and cheese.....	25%
<b>Trucks, Warehouse, &amp;c.-</b>	
B. & L. Block Co's list, '82.....	40%
<b>Tubes, Boiler-</b>	
See Pipe.	
<b>Twine-</b>	
Flax Twine.....	BC. B.
No. 9, 1/4 and 1/2 B Balls.....	30%
No. 12, 1/4 and 1/2 B Balls.....	21%
No. 18, 1/4 and 1/2 B Balls.....	18%
No. 24, 1/4 and 1/2 B Balls.....	18%
No. 30, 1/4 and 1/2 B Balls.....	16%
No. 204, Matraze, 1/4 and 1/2 B Balls.....	25%
Chalk Line, Cotton, 1/4 B Balls.....	55%
Mason Line, Linen, 1/4 B Balls.....	55%
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring Twine).....	11 1/2%
3-Ply Hemp, 1/4 B Balls.....	12 1/2%
3-Ply Hemp, 1/4 B Balls.....	11 1/2%
Cotton Wrapping, 5 Balls to B.....	15&16%
2, 3, 4 and 5-Ply Jute, 1/4 B Balls.....	10%
Wool.....	6 1/2&6 1/2%
Paper.....	13&14%
Cotton Mops, 6, 9, 12 and 15 lb to do.....	18%

<b>Vices—</b>	
Solid Box.....	50&60&5%
<b>Parallels—</b>	
Fisher & Norris Double Screw.....	15&10%
Stephens.....	25&30%
Parker's.....	20&25%
Wilson's.....	55%
Howard's.....	40%
Bonney's.....	40&10%
Millers Falls.....	40&5&40&10%
Trenton.....	40&5&40&10%
Merrill.....	15&20%
Sargent's.....	60&10&10%
Backus and Union.....	40%
Double Screw Leg.....	15&10%
Prentiss.....	20&25%
Simpson's Adjustable.....	40%
Moore's.....	20%
<b>Saw Vices—</b>	
Bonney's, Nos. 2 & 3, \$15.00.....	40&10%
Stearns.....	33&2&10&50&10&10%
Stearns' Silent Saw Vices.....	33&2&3%
Sargent's.....	60&10%
Hopkins.....	\$ doz \$17.50, 10%
Reading.....	40&10%
Wentworth.....	20&10%
Combination Hand Vices.....	\$ gr \$42.00
Cowell Hand Vices.....	30%
Bauer's Pipe Vices.....	10%
<b>Wagon Boxes—</b>	
Per B.....	2 1/4%
<b>Wagon Jacks—</b>	
Daisy.....	25%
<b>Washer Cutters—</b>	
Smith's Pat.....	\$ doz \$12.00, 20&10&10%
Johnson's.....	\$ doz \$11.00, 33&4%
Penny's, & doz Pol. \$14; Jap'd, \$16.00, 55%	
Appleton's.....	\$ doz \$16.00, 20&10%
Bonney's.....	30&10%
<b>Washers—</b>	
Size.....	5-16 3/4 3/8 3/4 1
Washers.....	7 5/8 4 3/4 3 3/4 3 3/4 3 3/4
In lots less than 200 lb, \$ doz, add 1/4¢, 5 lb boxes 1¢ to list.	
<b>Wedges—</b>	
Iron.....	\$ 3 3/4
Steel.....	\$ 4 1/4
<b>Well Buckets, Galvanized—</b>	
Hill's.....	\$ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad.....	\$ doz, 14 qt, \$4.25&4.50
Whiting's Flat Iron Band.....	\$4.25&4.50
Whiting's Wired Top.....	\$ doz \$4.00&4.25
<b>Well Wheels—</b>	
8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25	
<b>Wire—</b>	
<b>Iron—</b>	
Market.....	72&25%
Br. & Ann., Nos. 0 to 18.....	70&10&75%
Cop'd, Nos. 0 to 18.....	70&70&5%
Galv., Nos. 0 to 18.....	55&5%
7/8 in., Tinned list Nos. 0 to 18.....	67&4%
Stone.....	
Br. and Ann'd, Nos. 16 to 18, 72 1/2	
Bright and Ann'd, Nos. 19 to 26, 71 1/2	
Br. and Ann'd, Nos. 27 to 36, 75&10&5%	
Tinned.....	70&70&10%
Tinned Broom Wire.....	70&5&70&10%
Galvanized Fence.....	65%
Annealed Fence, Nos. 8 and 9.....	75%
Annealed Grape, Nos. 10 to 14.....	15&20%
Brass, list Jan. 18, 1884.....	30 @ 35%
Copper, list Jan. 18, 1884.....	\$4.25&4.50
7/8 in. Fence.....	See Trade Report
Wire on Spools.....	65%
Malin's Steel and Tind Wire on Spools.....	40%
Malin's Brass and Cop. Wire on Spools 30%	
Cast Steel Wire.....	70&10%
3/8 in. Steel Wire.....	\$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 80, 55%	
Picture Wire.....	New list, 50%
Barb Wire Safety Guards.....	\$ 1000, \$9.00, 25%
Wire Clothes Lines, see Lines.....	
<b>Wire Cloth, Netting, &amp;c.—</b>	
Painted Screen Cloth, good quality.....	\$ 100 sq. ft., \$1.80 @ \$1.90
Galvanized Wire Netting.....	75&75&5%
<b>Wire Goods—</b>	
See Bright Wire Goods.	
<b>Wire Rope—</b>	
List May 1, 1886.....	
Iron.....	30%
Cast Steel.....	40%
<b>Wrenches—</b>	
American Adjustable.....	40%
Baxter's Adjustable "S".....	40&10&50%
Baxter's Diagonal.....	40&10&10%
Coe's Genuine.....	55&2%
Coe's "Mechanics".....	55&10&3%
Girard Standard.....	70&10%
Macbinists'.....	70&10%
Lane's list Sessions' Engineers'.....	60&10%
Lamson & Sessions' Standard.....	70&10%
Coe's Pattern, Wrought.....	
Girard Agricultural.....	80%
Lamson & Sessions' Agric'l.....	
Berling Wrought.....	
Bemis & Combination.....	35%
Merrick's Pattern.....	35%
Brigg's Pattern.....	25%
Cylinder or Gas Pipe.....	40&5%
No. 3 Pipe.....	40&10%
Alken's Pocket (Bright).....	\$6.00, 50&10%
The Favorite Pocket.....	\$ doz \$4.00, 40%
Webster's Pat. Combination.....	25%
Boardman's.....	20&10%
Always Ready.....	25&5%
Alligator.....	20&10%
Donohue's Engineer.....	60&2%
Acme, Bright.....	55&2%
Walker's, Galv'd.....	55&2%
Diamond Steel.....	55&2%
<b>Wringers, Clothes—</b>	
List March 11, 1889, 2% cash.	
<b>Wrought Goods—</b>	
Staples, Hooks, &c., list Jan. 12, 1886.....	80&20&3&4&2%

**JUNE 26, 1889.**

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

Single.											
SIZES					1st.	2d.	3d.	4th.			
					E F H	I E H	F H	H B			
35	6	x	8	to 10	x	15	.....	\$10.50	\$9.00	\$8.50	\$8.00
40	11	x	14	to 16	x	24	.....	11.50	10.75	10.25	9.75
50	18	x	22	to 20	x	30	.....	15.50	14.00	13.00	12.50
54	15	x	28	to 24	x	30	.....	16.50	15.00	13.50	.....
60	25	x	28	to 24	x	36	.....	17.75	16.25	14.75	.....
70	25	x	36	to 28	x	44	.....	19.00	17.50	15.25	.....
80	25	x	46	to 30	x	50	.....	21.00	19.50	17.00	.....
84	30	x	52	to 30	x	54	.....	22.00	20.25	18.00	.....
90	30	x	56	to 34	x	56	.....	23.00	21.25	19.00	.....
94	34	x	58	to 34	x	60	.....	24.00	22.75	21.00	.....
100	36	x	60	to 40	x	60	.....	26.50	24.50	23.00	.....

**THE IRIDIUM ANTI-FRICTION METAL**

(Title Registered and Copyrighted 1888)

Is a bearing alloy that will give the *best service* and satisfaction to whatever use it is put. Our continuous orders from our large number of customers is practical and satisfactory evidence; no further needed.

The Iridium Anti-Friction Metal takes the place of Genuine Babbitt or "brasses," with a great saving in money. It is sold at a fair price over cost of manufacture.

Feeling *positive* it will be of *advantage to you* to use it, we solicit a trial order from all who have not adopted it—those who *have* we *hold*, in spite of big advertisements of high-priced metals that cost but *little to make*, though probably much to *sell*.

**MERCHANT & CO., - - Philadelphia, New York, Chicago, London.**

**ZERO****Post's Zero Metal,**

REGISTERED IN U. S. A.,

The Coolest Wearing and Most Economical  
Metal on the Market.

**F. R. PHILLIPS, 407 Walnut Street, Philadelphia.**

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**DE-OXIDIZED ANTI-FRICTION METALS.**

All Grades, from "GENUINE BABBITT" down to a 5-CENT METAL.

We do not sell any LOW-GRADE METAL with a FANCY NAME and ask THREE TIMES ITS COST, but all OUR GRADES ARE PROPORTIONED TO THEIR COST. ANALYSES furnished to our customers of the VARIOUS FANCY BRANDS now flooding the market, so that they may know what they are asked to pay for.

**DE-OXIDIZED BRONZE "JOURNAL BEARINGS,"**

best for wear and anti-friction qualities. DE-OXIDIZED BRONZE ALSO RESISTS ACID AND ACID WATERS PERFECTLY IN PUMPS, VALVES, &c.

**THE DE-OXIDIZED METAL CO., Bridgeport, Conn.**

**PHOSPHOR BRONZE**

ALL GENUINE  
INGOTS & MANUFACTURES  
BEAR OUR  
REG. TRADE MARKS.

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INGOTS, CASTINGS &amp; MANUFACTURES.

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ORIGINAL MANUFACTURERS OF PHOSPHOR-  
BRONZE IN THE UNITED STATES AND OWNERS  
OF THE U.S. PATENTS.

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SMELTERS OF SPELTER,

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SHEET ZINC AND SULPHURIC ACID

Special Sizes of Zinc cut to order. Rolled Battery Plates.

Selected Plates for Etchers' and Lithographers' use.

Selected Sheets for Paper and Card Makers' use.

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ZINCS FOR LECLANCHE BATTERY.

**THE CELLULOID VARNISH COMPANY,**

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MANUFACTURERS OF PAPER ENAMELS, METAL LACQUERS AND

WOOD VARNISHES FROM CELLULOID.

Kristaline for protecting metal goods from Tarnish, Dial Varnish Transparent and Colored  
Wood Varnishes.

**PASSAIC ZINC CO.**

MANUFACTURERS OF

**Pure Spelter**

FOR

Cartridge Brass, Gas Fixtures, Bronzes  
AND ALL FINE WORK.

Also for

GALVANIZERS AND BRASS FOUNDERS.

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Proprietors of the

**BELLEVILLE COPPER ROLL'G MILLS**

Manufacturers of

**Braziers, Bolt and Sheathing  
COPPER.**

COPPER WIRE AND RIVETS.

Importers and Dealers in

Ingot Copper, Block Tin, Spelter,  
Lead, Antimony, etc.

**49 CLIFF ST., NEW YORK,**

Bet. Beekman and Fulton Sts.

THE BEST AND CHEAPEST

**Tack Nail, Wire Nail and Rivet  
MACHINES.**

**WM. A. SWEETSER,**

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# Washburn & Moen Manuf'g Co.,

WORCESTER, MASS., NEW YORK CITY, CHICAGO,

MAKERS OF IRON AND STEEL

EVERY VARIETY OF **W I R E** FOR ALL PURPOSES.

*Hard and Soft Drawn Copper Wire for Electrical Purposes; Galvanized Iron and Steel Telegraph and Telephone Wire; Glidden Patent Steel Barb Wire; Watch and Clock Main Springs; Eyeglass Springs; Steel Wire for Needles and Drills; Patent Steel Wire Bale Ties; Pump Chain; Two Strand Twisted and Flat Twisted Fence Wire without Barbs; Fence Staples, Stretchers, &c.; Bright, Annealed, Tinned, and Galvanized and Copper Wire, on Spools 1 oz. to 1 lb.*

Wire Rope



and Cable.

Galvanized Iron Wire Rope for Ships' Rigging, &c. Galvanized Steel Wire Cables for Suspension Bridges. Transmission and Standing Ropes, Hoisting Ropes, Tiller Ropes, Switch Ropes, Copper, Iron and Tinned Sash Cord, Phosphor-Bronze and Copper Wire Rope, Wire Clothes Lines, Picture Cord, Galvanized Wire Seizing, and all the Fixtures and Appliances required for use with the foregoing. The famous yachts Mayflower, Volunteer and Sachem are all rigged with our Wire Rope.

SEND FOR PRICE LISTS, CIRCULARS AND DESCRIPTIVE PAMPHLETS.

New York Warehouse, 16 Cliff St. Chicago Warehouse, 107 & 109 Lake St. San Francisco Warehouse, 81 Main St.

THE TRENTON IRON CO., Trenton, N. J. COOPER, HEWITT & CO., New York.

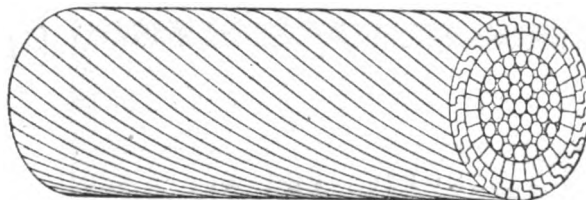
— MANUFACTURERS OF —

## IRON AND STEEL WIRE

of every description, plain, galvanized, tinned and lead-coated; spiral ribbon fence wire; steel wire ties for baling hay, straw, rags, excelsior, &c., &c., &c.

### IRON AND STEEL WIRE ROPE

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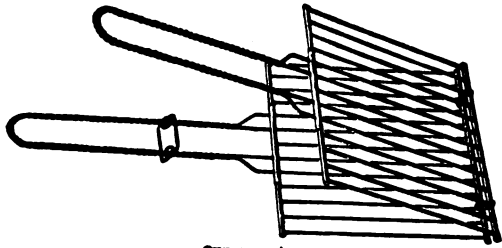
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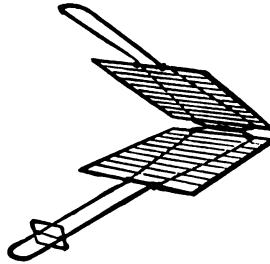
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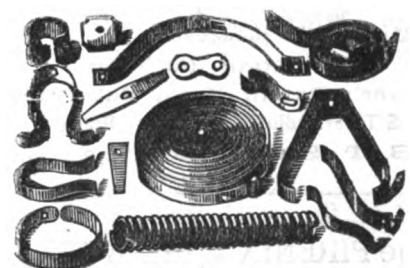
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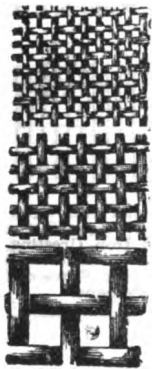
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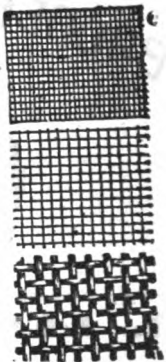
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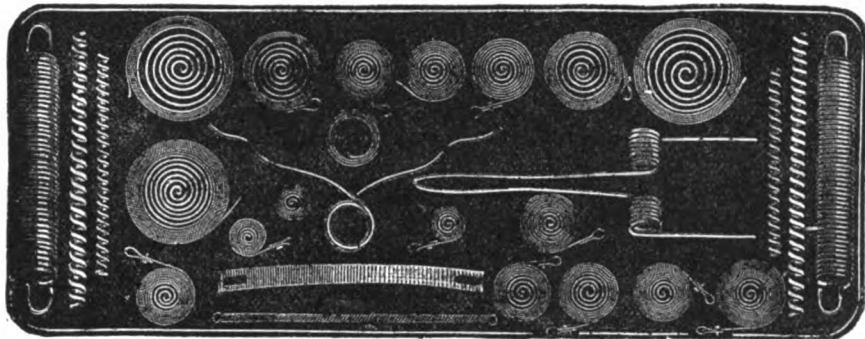
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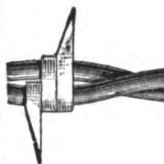
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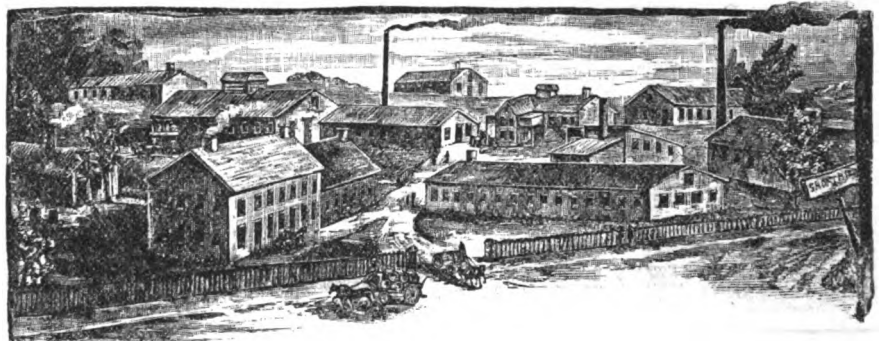
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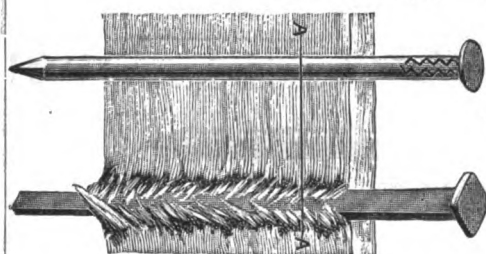
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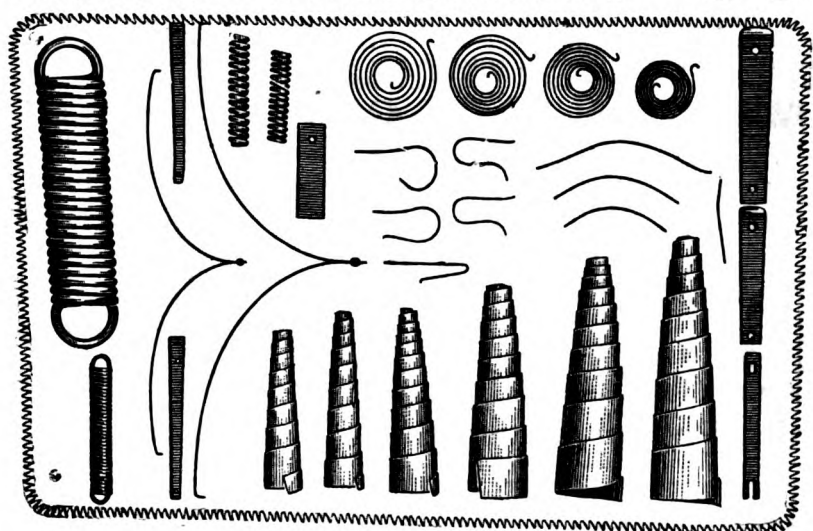


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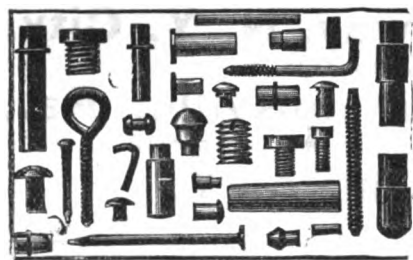
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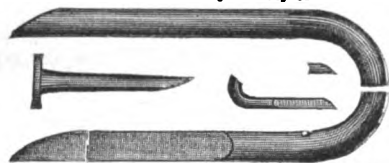
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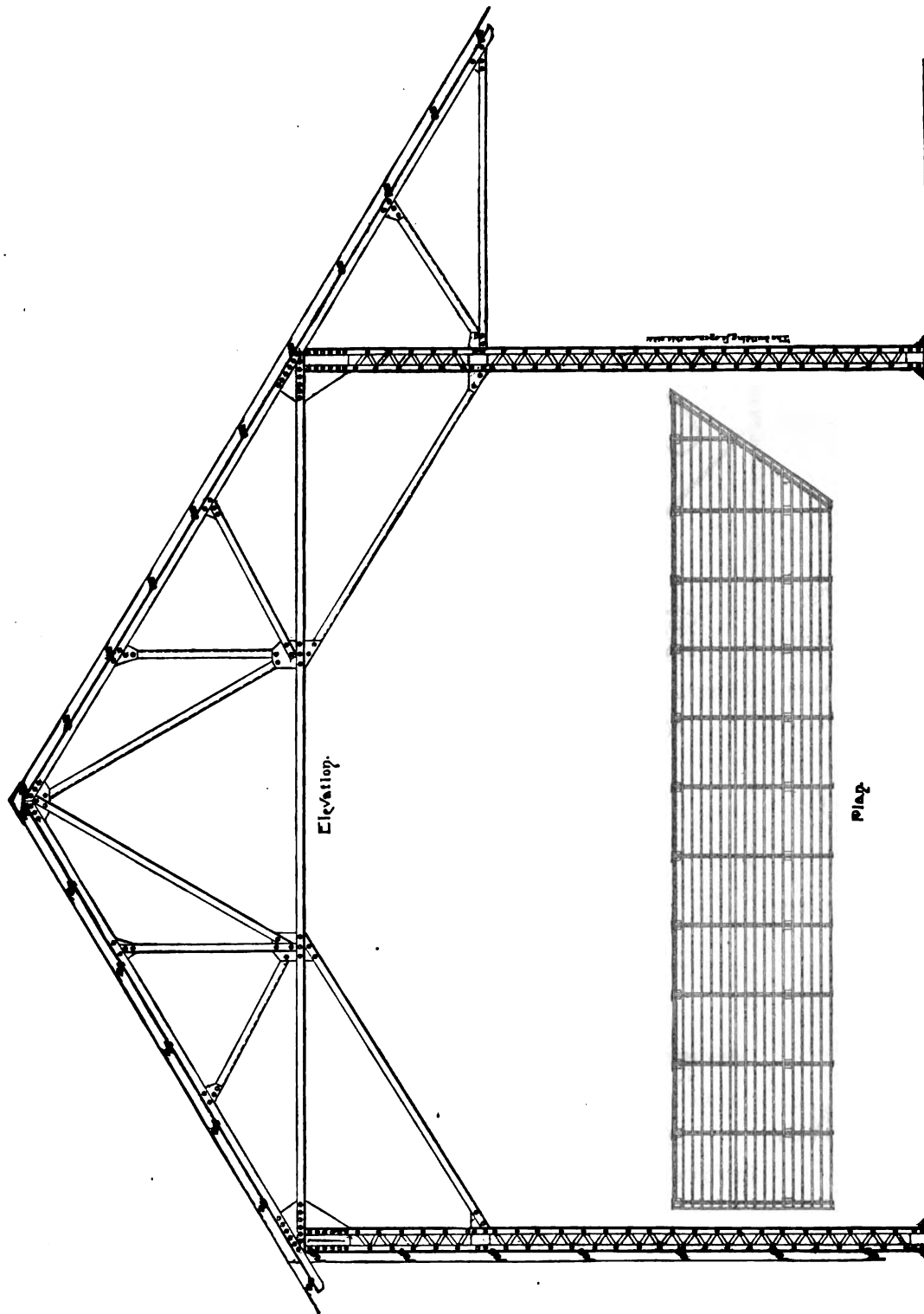


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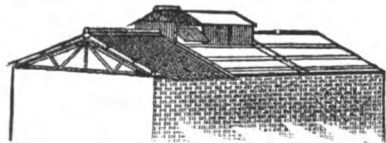


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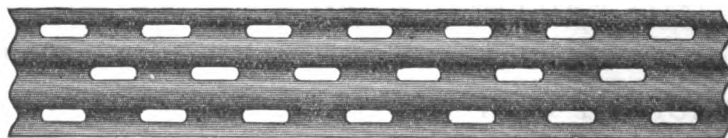
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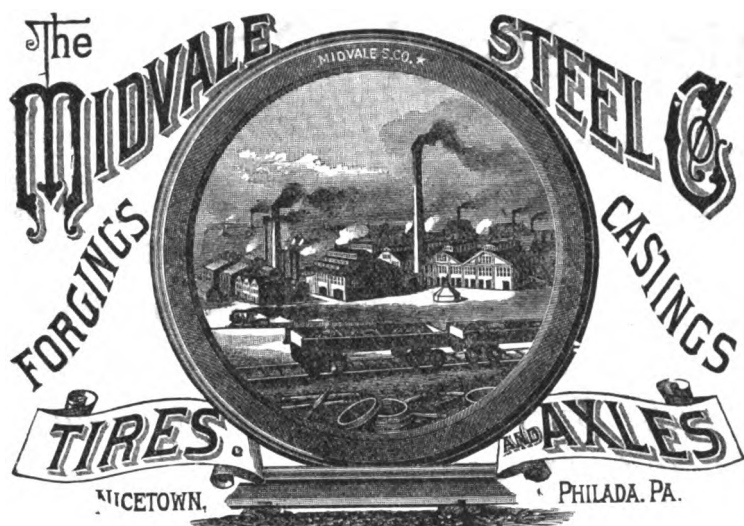
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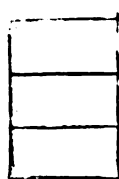
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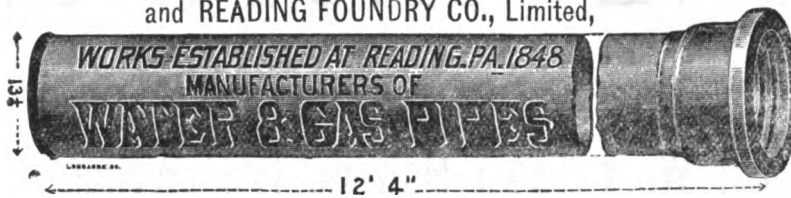
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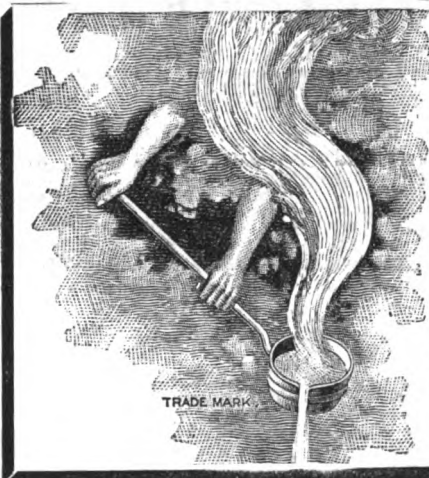
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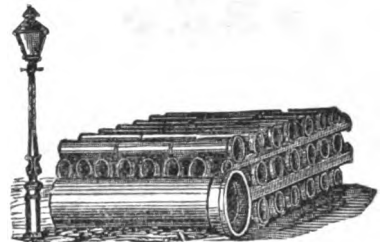
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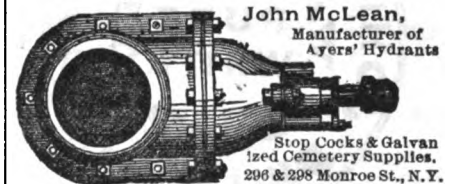
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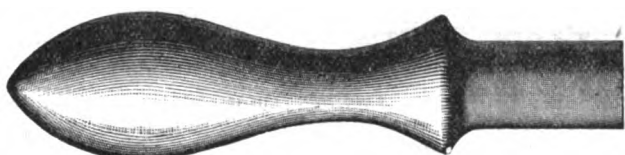
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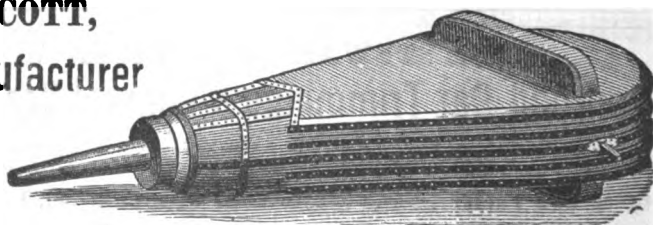


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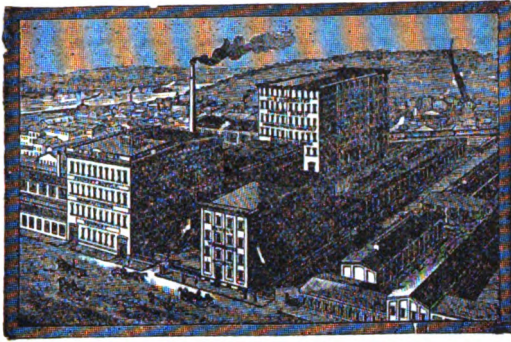
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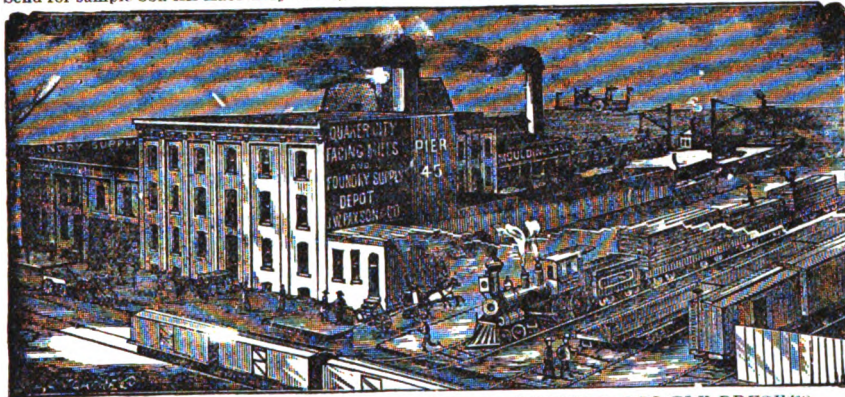
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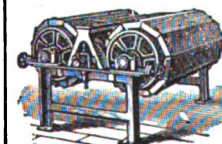
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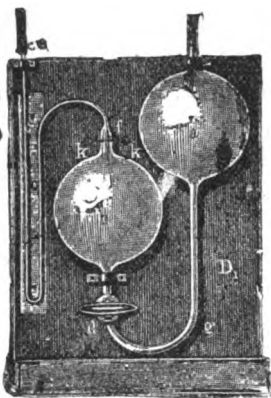
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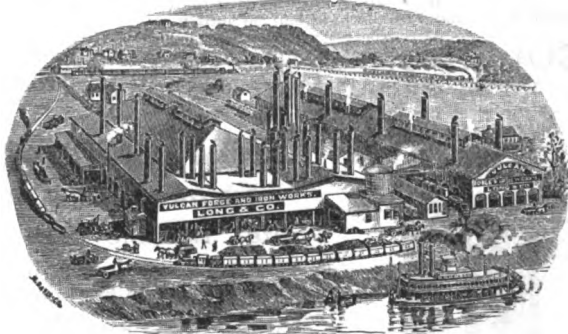
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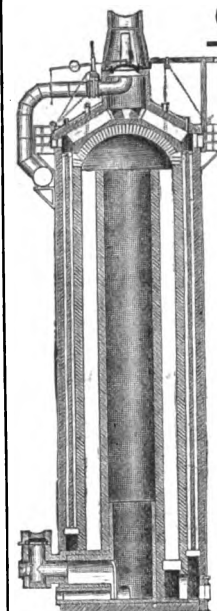


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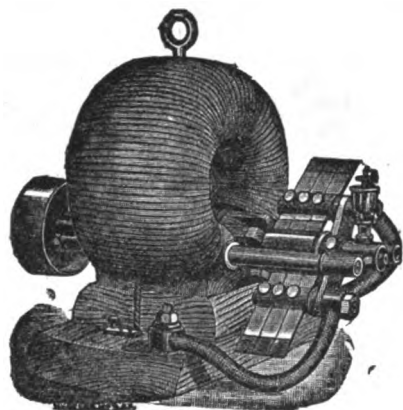


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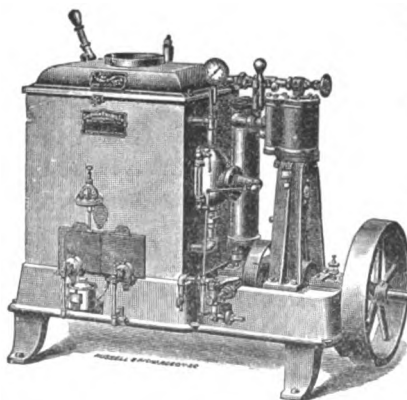
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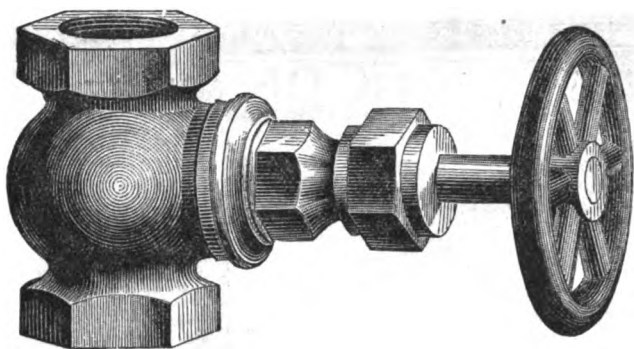
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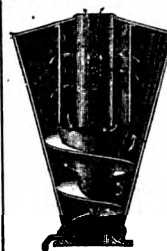
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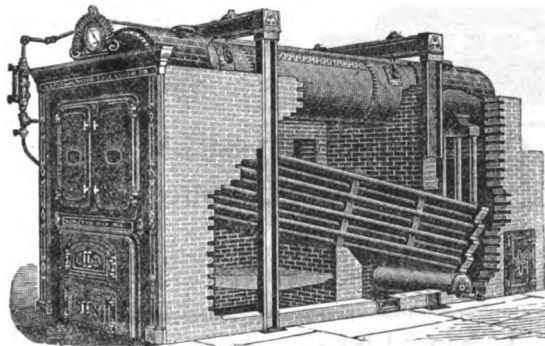
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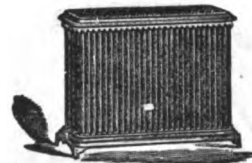
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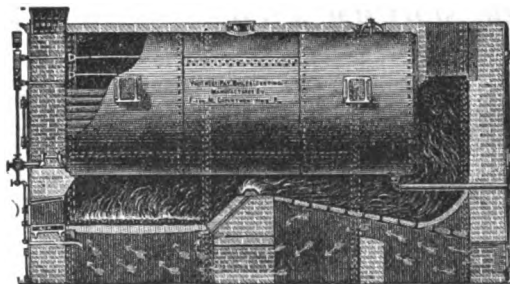
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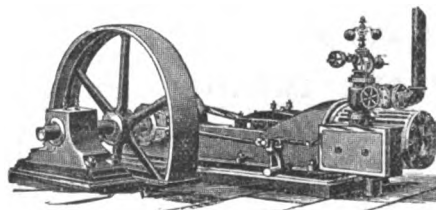
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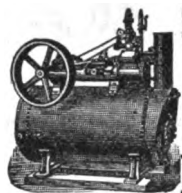
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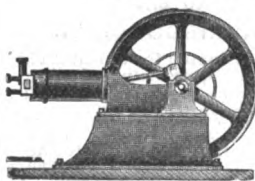
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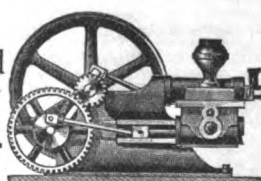
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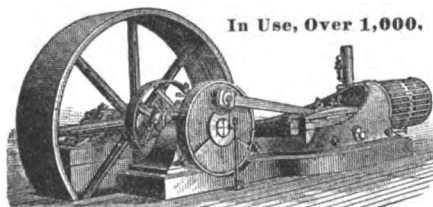
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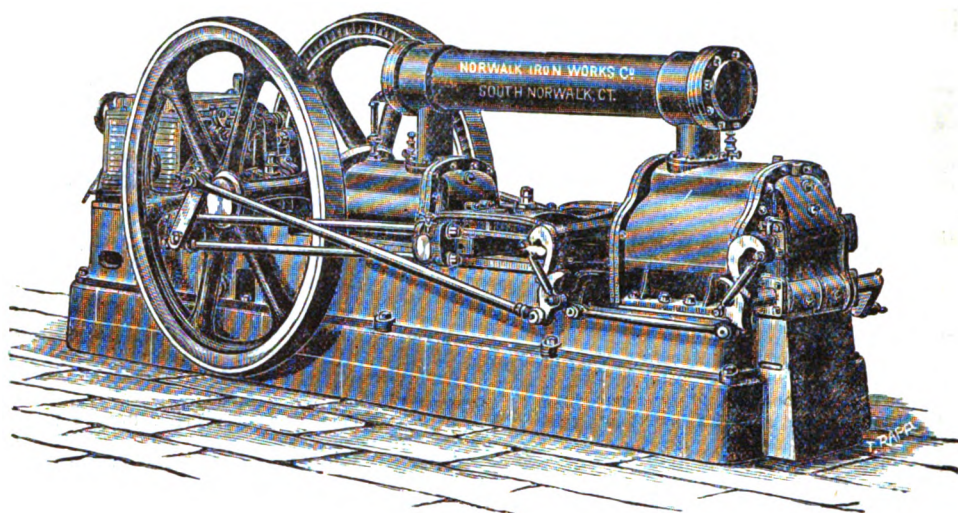
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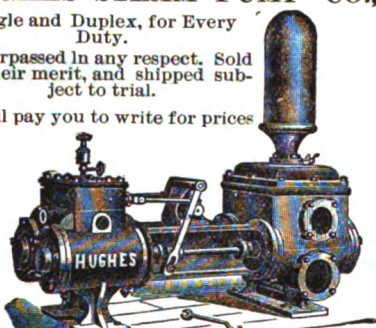


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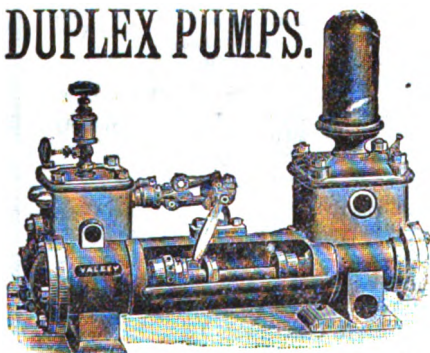
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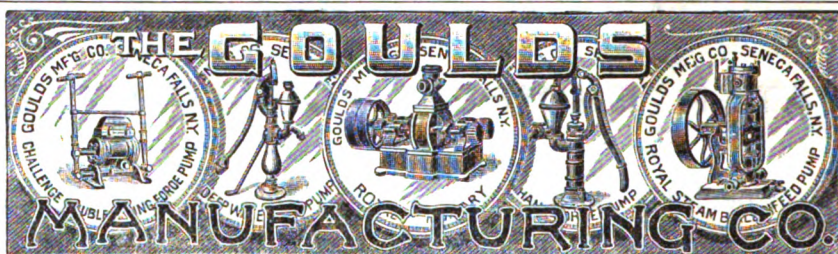
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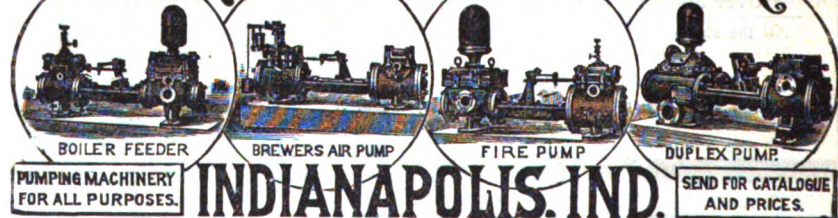
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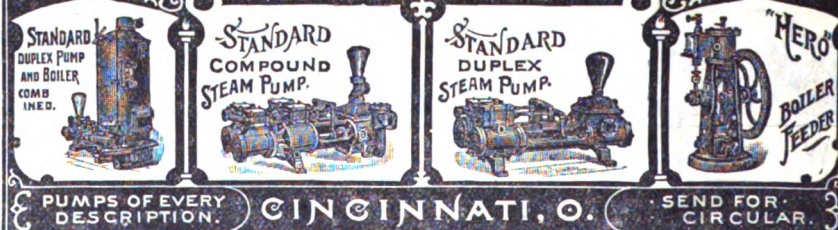


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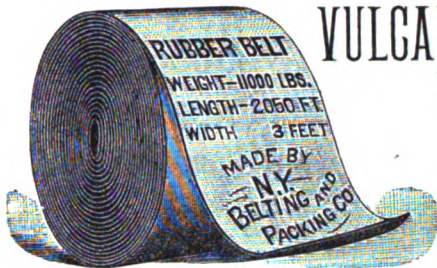


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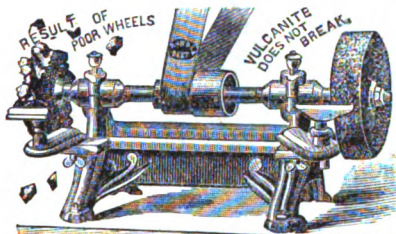
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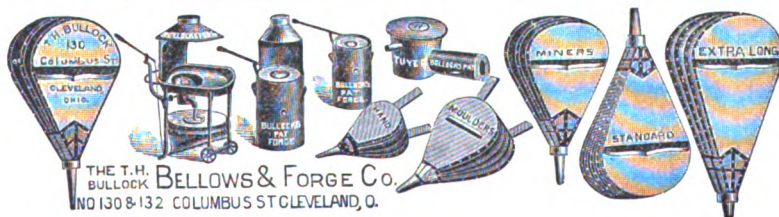
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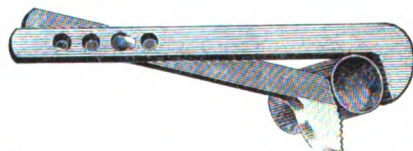
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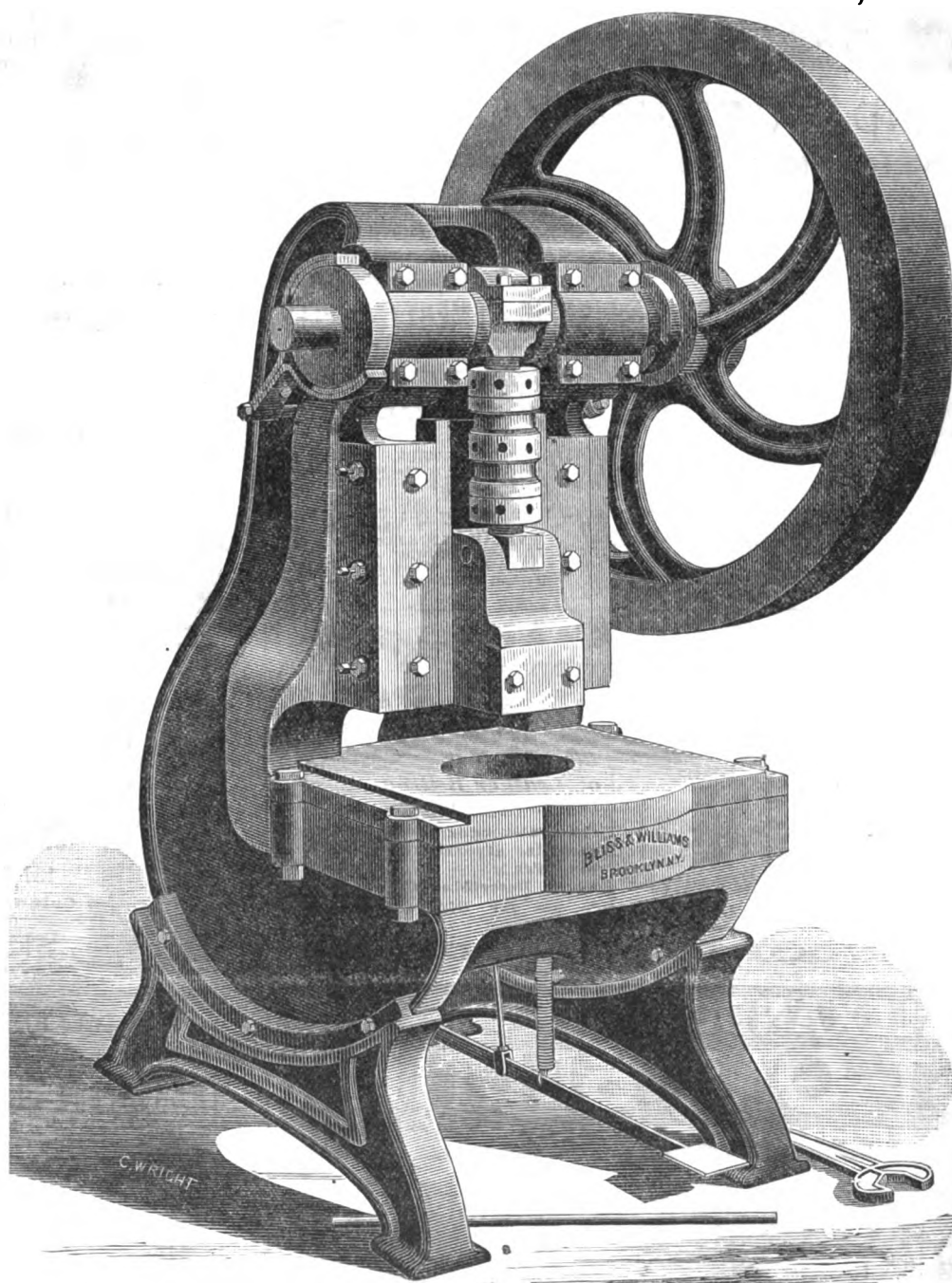
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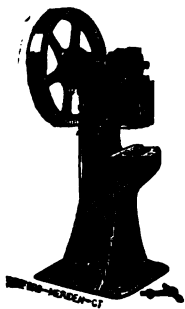
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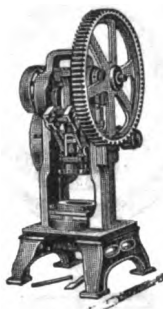
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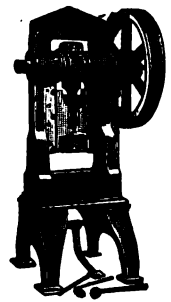
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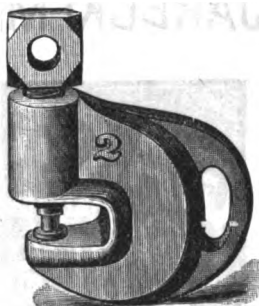
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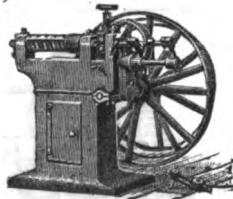
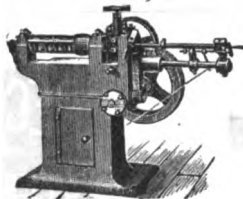
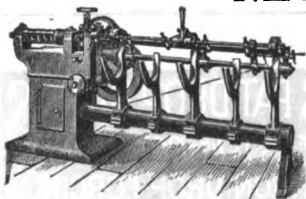
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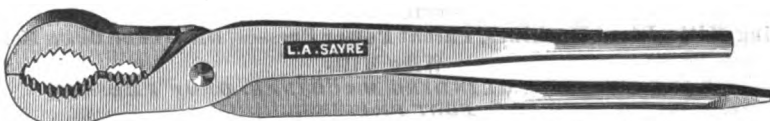


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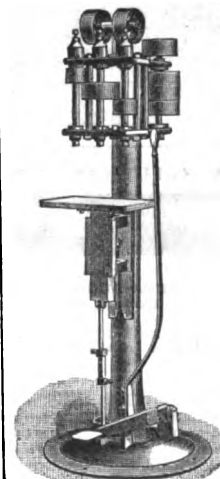
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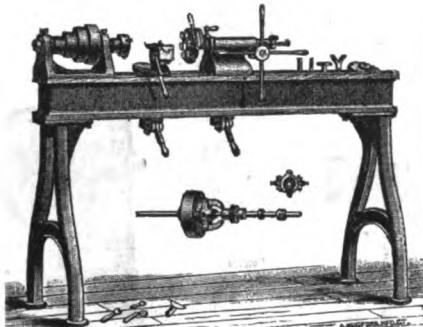
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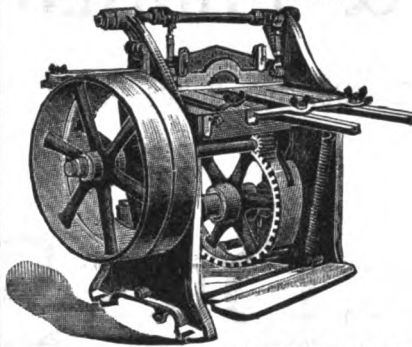
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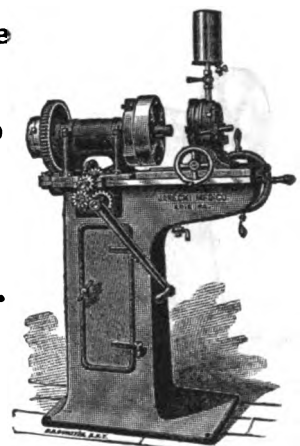
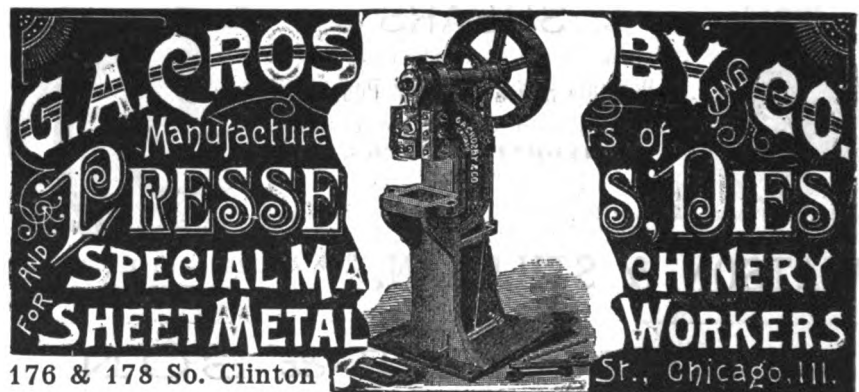
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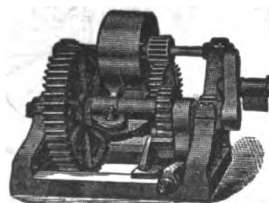
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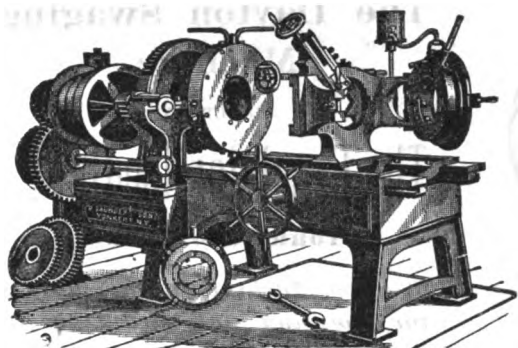
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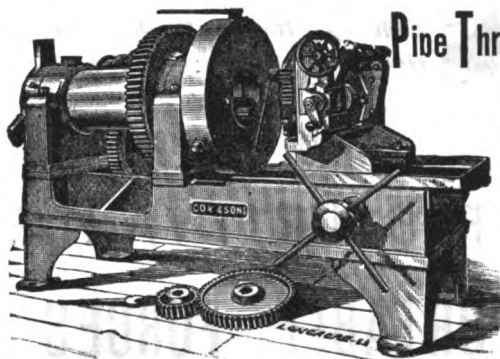
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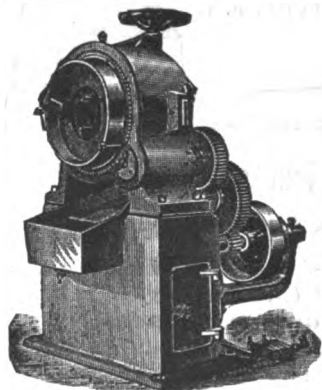
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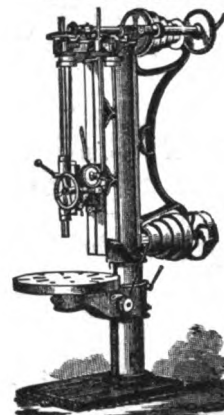
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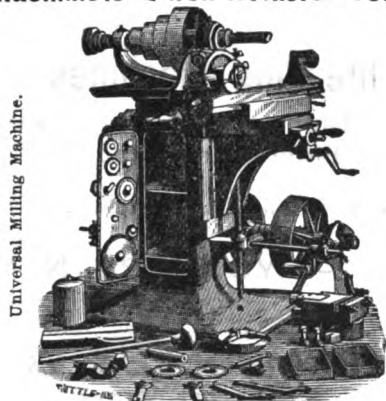
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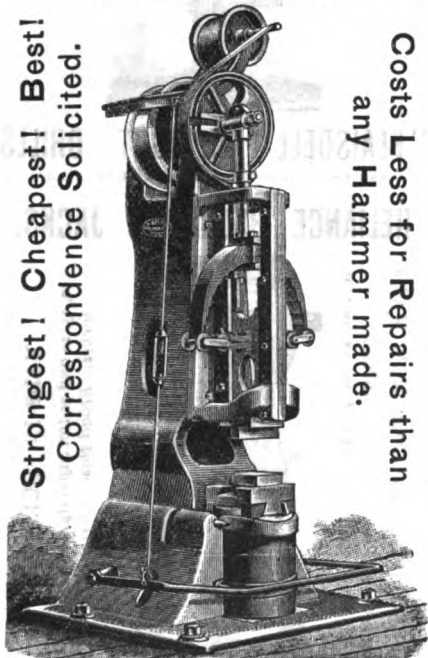


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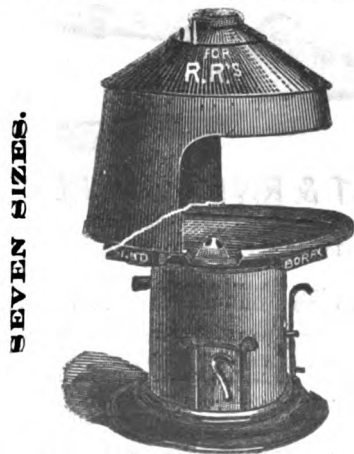
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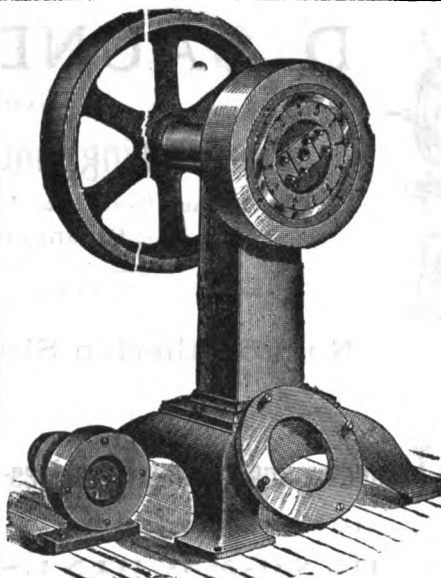
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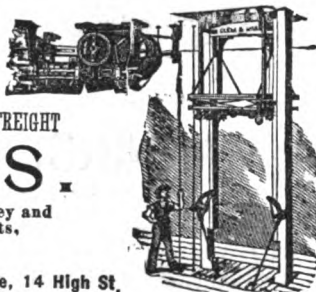
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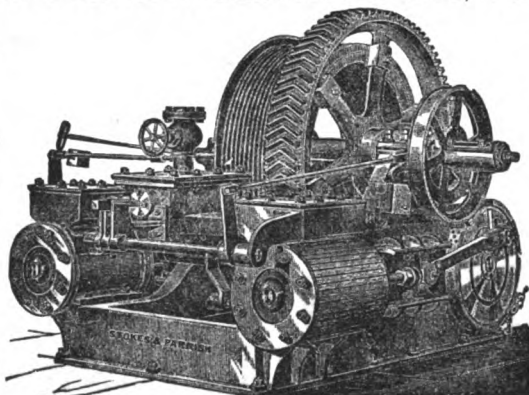
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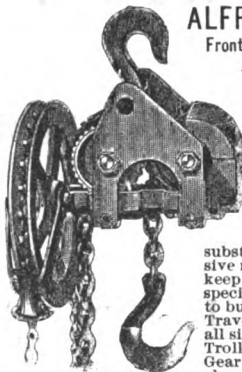
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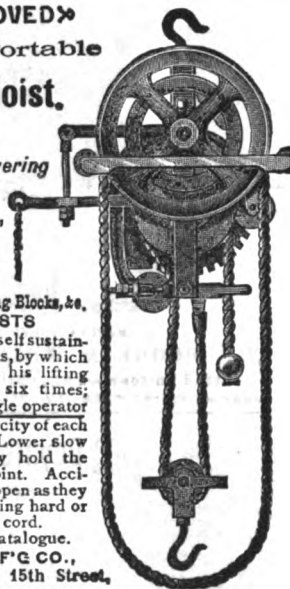
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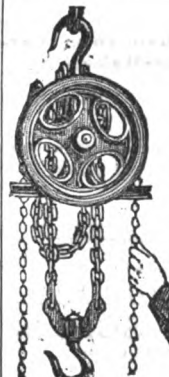
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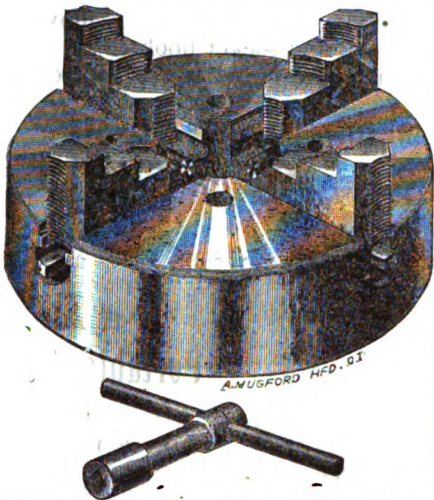
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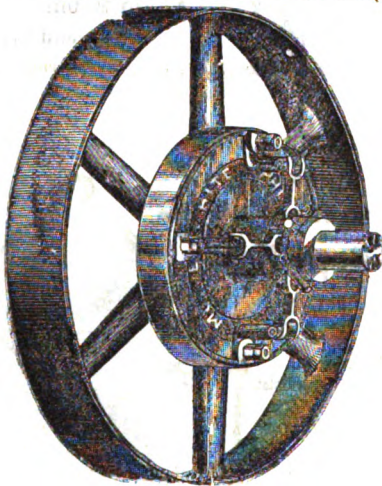
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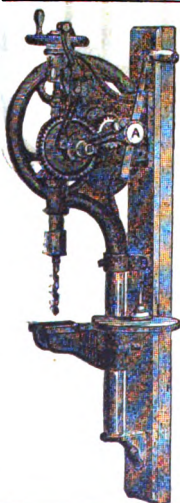
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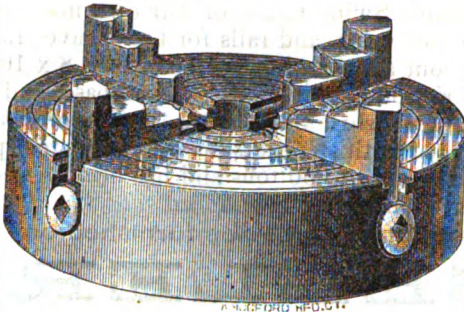
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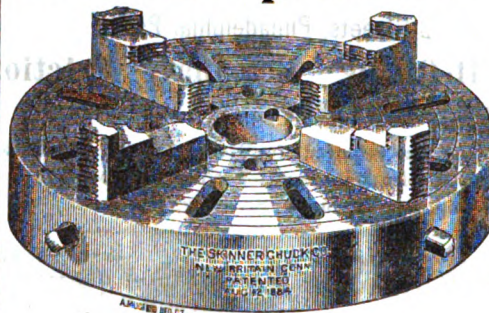
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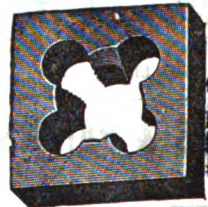
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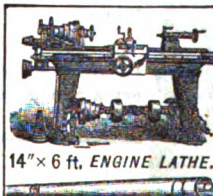


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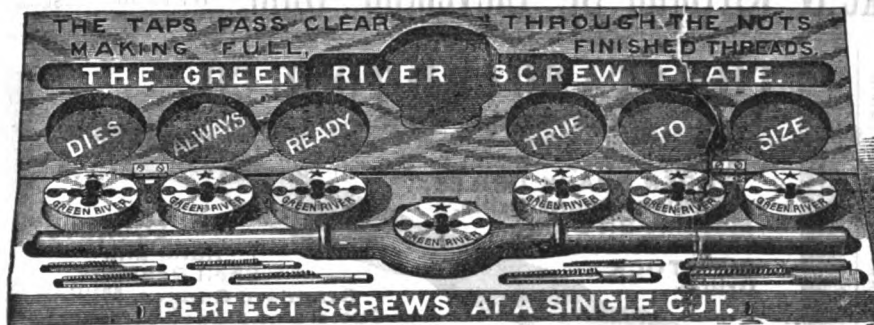
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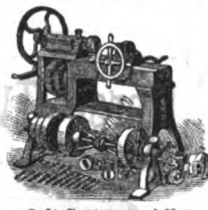
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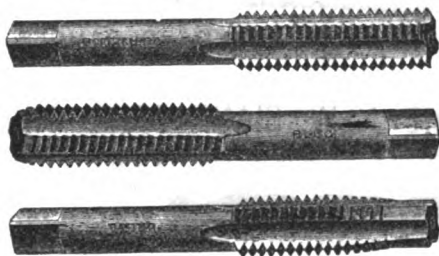


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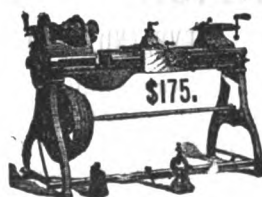


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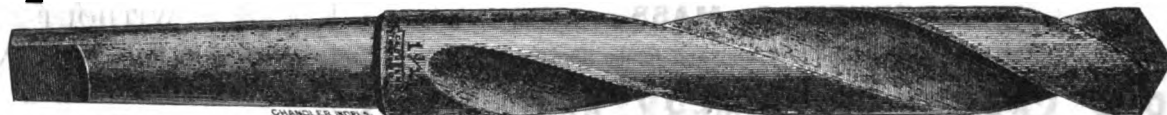
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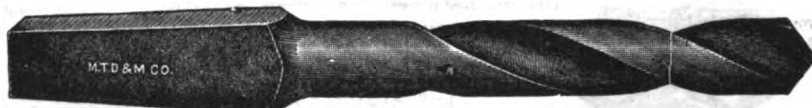
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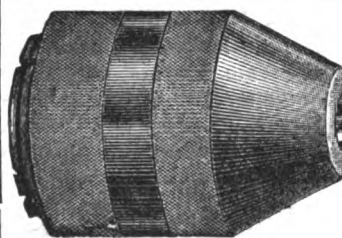


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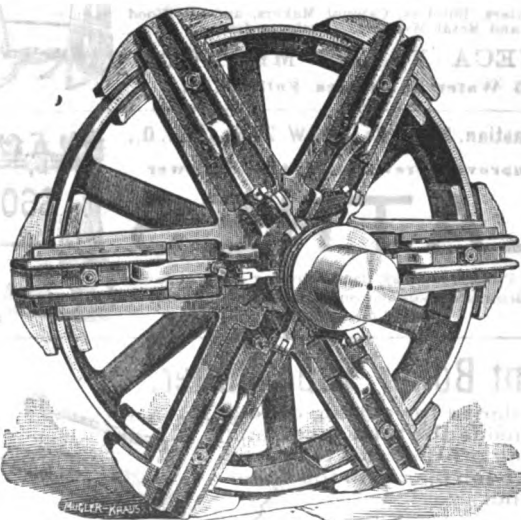
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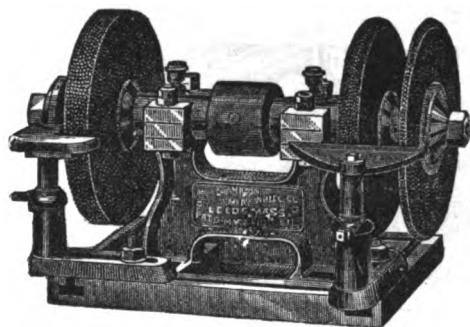
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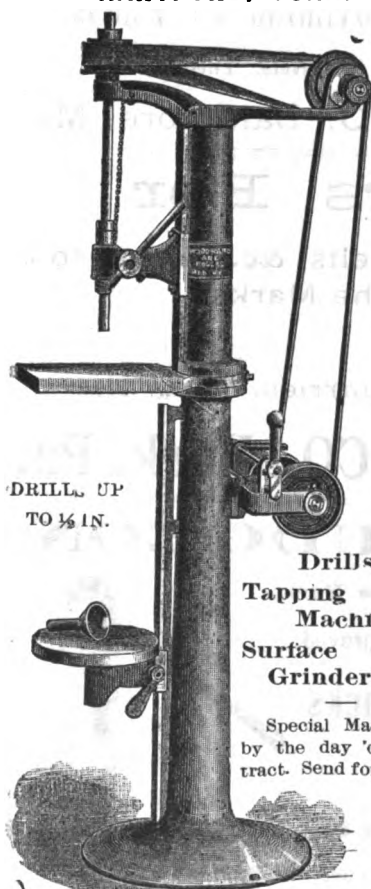
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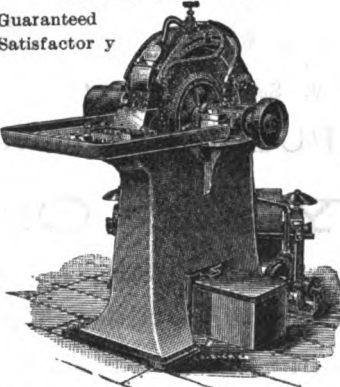
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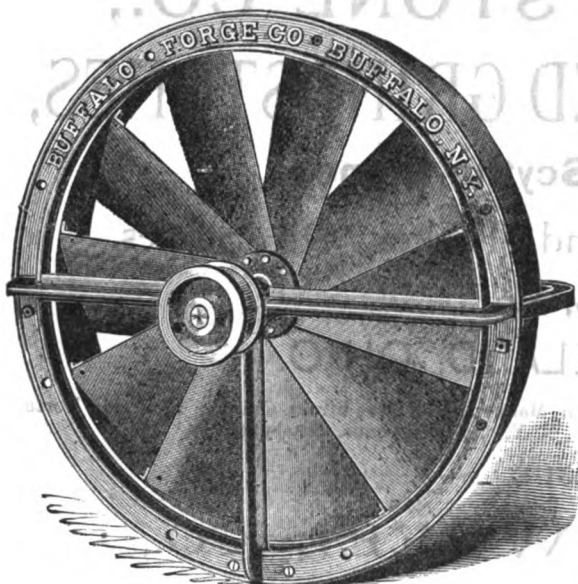
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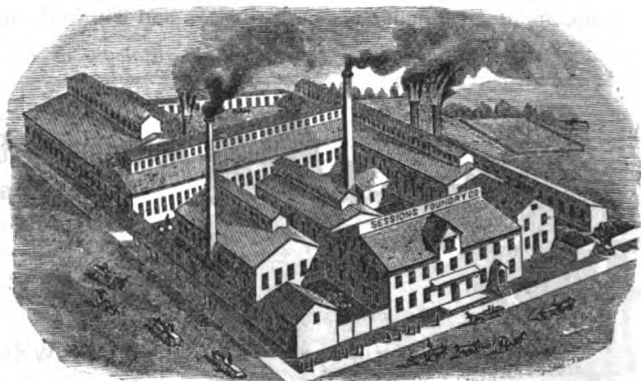
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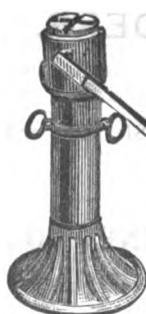
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 50 Upright Steel Tubular Boilers; new; 4-27 H.P.; cheap  
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 1 Engine Lathe, 36 in. x 20 ft.  
 1 Engine Lathe, 36 in. x 13 ft.  
 1 Bishop Engine Lathe, 34 in. x 20 ft.  
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 13 Drill Presses, 10-25 in. swing. Best makes.  
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 Estimates furnished on application for Steam Plants  
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One Gear Molding Machine. Almost new.  
 One 700 pound Drop Hammer. Very good.  
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 Three Punching Presses. New and second-hand.  
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 One 16 " " " "  
 One No. 2 and 4 Roots Pressure Blowers. Very good.  
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One Cameron No. 12;  
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 1 Rotary Squeezer, will take 225 lb. Ball.  
 2 Tumblers (Cylinders 48 in. x 30 in.)  
 1 Atomizer, for coal or other material.

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bought, sold, or taken in exchange for new.

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 heated by steam; they are making profitable work on  
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 ers are engaged other ways, and not acquainted with  
 the machinist business; this is a good opportunity to  
 buy at a reasonable figure a well-established manu-  
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 for additional and detailed information address  
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### FOR SALE.

Complete plant for making wire nails, con-  
 sisting of 12 nail machines, drums, barbing  
 machine, lathes, drills, shafting, pulleys, hang-  
 ers, belting and all necessary tools and imple-  
 ments for the business; also patents for machines  
 and process. Apply to  
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### SECOND-HAND

#### ENGINE - LATHES

—AND—

#### IRON PLANERS.

Also Milling Machines, Screw Ma-  
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Send for complete June list.

### Hill, Clarke & Co.,

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### Boilers and Engines.

126 Vertical Boilers.  
 217 Locomotive Boilers.  
 119 Return Tubular Boilers.  
 At your own prices.  
 2 50 H.-P. Locomotive..... at \$350  
 1 30 " " ..... 200  
 3 12 " Marine, 125 lbs. steam ..... 250  
 All must be sold.

**H. M. SCIPLE & CO.,**

3d & Arch, Philadelphia.

PRICE OF ENGINES NEXT WEEK.

### Second-Hand Machinery Cheap.

1 30 in. x 30 in. x 6 ft. Pratt & Whitney Planer. Good  
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 1 12 in. x 4 ft. P. & W. Lathe, Pulley Feed-Weight Car-  
 riage. Fair order.  
 1 P. & W. Index Miller, with Centers. Good order.  
 1 30 in. x 18 ft. Engine Lathe. Fair order.  
 1 18-in. Bissell Crank Planer. Good order.  
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 1 8-spindle Gang Drill. Good order.  
 1 Power Press, 1 in. stroke. Good as new.  
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 1 4 h.-p. Upright Boiler, complete. Nearly new.  
 We keep in stock a large sample line of New Tools, of  
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 Second-hand Machinery bought and exchanged.  
 Correspondence solicited.

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### ROLLING MILL FOR SALE,

CONSISTING OF

One 2-high 18-in. Muck Mill with Engine with dupli-  
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 One 3-high 10-in. Bar or Guide Mill and Engine and 58  
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 One Rotary Squeezer, with duplicate Castings.  
 Twelve Single Puddling Furnaces with Boches, Tools,  
 Tapping Buggies complete and Castings for 6 more  
 Furnaces.  
 One Wappington Gas Heating Furnace, with 3 doors.  
 One Heating Furnace for using oil. One large power-  
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 Pan. One Roll Lathe.  
 One Steam Shear that will cut 4 1/4-in. Car Axle with ease.  
 One Muck Shear and 1 Guide Mill Shear. 3 Punches.  
 One 4-ton Steam Hammer, 28 in. Cylinder, 5 ft. stroke.  
 Four small Engines, small rails in track around the  
 mill, and lot of trucks, 1 10-ton Wagon Scale, 15-ton  
 Scale, 4 Rolling Mill Scales, 1 Sliding Saw.  
 One 72-in. x 10-ft. Steel Tubular Boiler, 2 1/2 in. x 16-ft.  
 6-Flue Boilers, 1 large Berryman Heater, nearly new.  
 Two Boiler Feed Pumps and 1 Fire Pump, complete.  
 Blacksmith Shop Outfit, Injectors, Steam and  
 Water Pipe, Valves and Fittings, lot of Floor Plates  
 and other material of value such as is general around  
 a Rolling Mill, too numerous to mention. This prop-  
 erty will be better known as the West Middlesex  
 Rolling Mill. This property must be sold altogether,  
 there being a rolling mill complete. Any part of  
 the machinery will not be sold separately, except  
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 be sold separate. For further particulars apply to  
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Machinists' Tools, Lathes, Planers, &c.: been  
 used about two years; now in fine order;  
 remains of bankrupt estate of engine works;  
 to be sold low for prompt cash. For particulars  
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1 Pair 20 in. x 48 in Corliss Automatic Engines.  
1 12 x 42 Green Automatic Engine.  
1 12 x 24 in. Horizontal Engine.  
1 8 in. x 15 in. " " New.  
1 5 in. x 10 in Horizontal Engine.  
1 10 H.-P. Horizontal Engine.  
1 4 H.-P. Portable Engine and Boiler.  
1 6 Horse-Power Upright Engine.  
1 5 x 12 Double-Drum Hoisting Engine and Boiler.  
1 40 H.-P. Locomotive Boiler.  
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1 15 H.-P. New Upright Steel Boilers.  
1 New Steel Yacht Boilers.  
1 No. 2. Brainerd Universal Milling Machine.  
100 Cutters for Milling Machine.  
1 42 in. x 8 ft. Pond Planer, nearly new.  
1 9 in. Cylinder McDougal & Potter Steam Hammer.  
1 30 in. Pond Drilling Machine.  
1 16 in. x 6 ft. Engine Lathe.  
1 14-in Stroke, Hewes and Phillips Shaper.  
1 22 in. Prentiss Drilling Machine.  
1 Ames 4-Spindle Drills.  
1 Pratt & Whitney 4-Spindle Drill.  
1 Double-Spindle Milling Machine.  
1 12 in. Heavy Slotting Machine.  
1 4 in. Morris & Tasker Pipe Threading Machine.  
1 Set Rubber Grinding Rolls.  
6 Tanks, 8 ft. x 5 ft. x 5 ft. 3 in.  
Nos. 3, 4, 5 and 6 Woodward Steam Pumps.  
4 ft. Burr Mills, Complete.  
12 Contractors' Side-Dumping Cars.  
3 Ingersoll Rock Drills.  
2 Guild & Garrison Air Pumps.  
2 Large Vulcanizers or Digesters.  
1 Jacketed Kettles and Tanks.  
1 Bliss Foot Press, with dies complete for making tin cans, pints, quarts, half-gallons and gallons; also formers, rolls and sealers.  
1 Albany Steam Trap.

ROBT. J. GRAY

131st St. and Fourth Ave., New York.

## FOR SALE.

One Harrison Standard Safety Boiler, 37 H.-P.; one Westinghouse Automatic Engine, 8 x 8, 25 H.-P.; both but little used and in good condition; in part payment would take two cars of Box Boards or Shooks.

MT. CARMEL BOLT CO.,

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## Blowing Engines and Furnace Machinery FOR SALE.

One Horizontal Blowing Engine, direct acting, 86 in. x 72 in.; two air cylinders, 50 in. x 72 in.; has two heavy fly-wheels, pump, fixtures, &c. One Horizontal Blowing Engine, 24 in. x 72 in.; two air cylinders, 60 in. x 72 in.; has one fly-wheel, pump, fixtures, &c. The above engines are ready for immediate delivery and in very good order and of good make. Also two Air Receivers, 8 ft. x 24 ft.; one Air Receiver, 6 ft. x 24 ft.; quantity of 20-in. air-pipe, also water-pipe; cylinder boilers, 8 ft. x 40 ft. (suitable for stacks), three hot blast ovens, drums for hoisting engines, fire brick; in fact all the material of blast furnaces. For particulars and prices address the owners.

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## GOOD SECOND HAND TOOLS.

want to buy for cash good second-hand

**LATHES,  
PLANERS  
AND DRILLS.**

Address "A. B. S.,"

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## SAW FACTORY FOR SALE.

Located at Port Jervis, Orange County, N. Y.; completely furnished with Modern Machinery; capable of employing 200 hands; possession can be given immediately; price low; terms easy. Apply to

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Port Jervis, N. Y.

## Tack Machines for Sale.

A lot of small and medium Blanchard Tack Machines; nearly new. Address

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**FOR SALE.** A Brown (Fitchburg, Mass.) Engine 20 in. x 48 in., Corliss 18 in. x 42 in.

FRANK McWEGAN & SONS,

Bridge Store, Dover St. and Franklin Sq., New York

## HORSE NAIL MACHINERY FOR SALE AT A BARGAIN!

A SMALL INVESTMENT WITH A  
LARGE RETURN!

**\$2,500**

Will purchase all the Machinery and Tools necessary for making 1/4 ton of Horse Nails per day by the cheapest process in use.

These Nails can be sold at a good profit over and above cost of manufacture.

Combining this with some other manufacturing business where Rent, Power, Office, Traveling and other expenses will be at the minimum, it should pay very handsomely on the investment.

Machinery can be inspected at any time and samples of the Nails made with it can be seen.

— ALSO —

## SECOND-HAND MACHINERY!

ALL IN GOOD ORDER.

FOR SALE AT LESS THAN VALUE.

1 Planer—Jones & Lamson's make, 24 x 24 inches, 6 feet bed.

1 Planer—New Haven Mfg. Co. make, 18 x 18 inches, 3 1/2 feet bed.

1 Engine Lathe—14-inch swing, 4 feet between centers, screw cutting, countershaft, &c.

1 Drill Lathe—12-inch swing, 4 feet bed.

2 Post Drills—adjustable tables.

— ALSO —

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— OF THE —

## NEW HAVEN NAIL COMPANY,

RIVER STREET, NEW HAVEN, CONN.

Main Building, of wood, is 38 x 180 feet in size. There are two stories in front, facing the street, and running back 60 feet; the lower story is 12 feet high and the upper story 10 feet 6 inches. The rest of the building (70 feet deep) is one-story, with ventilators in the roof, and is 15 feet 10 inches high, making a large airy room, suitable for a variety of purposes.

The Boiler-Room and the Engine-Room are of brick, and are in dimensions as follows:

Boiler-Room 19 1/2 x 34 feet, Engine-Room 13 x 34.

Back of the Boiler Room is a brick coal bin.

Blacksmith Shop and Store-Rooms, at the rear of the factory, 19 x 38. On the west side, connecting Engine-Room with main building, is an addition 12 x 14. On the east side is an addition formerly used as a "tumbling-room" 9 1/2 x 28.

A Horse Shed, with closing doors, and the room next it measures 18 x 31.

Bigelow Engine, in good order, has a 12-inch cylinder and 30-inch stroke.

Two Tubular Boilers, made by the Bigelow Company, of 60 horse-power each, and first-class in every respect.

Four-Ton Fairbanks' Hay Scales is placed at rear of factory.

There is a small but very handy Elevator in front building.

Main Belt, Shafting and Countershaft go with building.

City Water in both front and rear, and Water Closets and Sinks for washing on both floors.

A substantial fence incloses the property and two other lots, and there is an entrance for teams through gates on both Chapel and River streets.

The lot is 100 x 138. Adjoining lots can be purchased if more room is wanted.

CONDITION OF PROPERTY.

These Shops were built in 1881, in a thorough and substantial manner, and they are now in good order and condition, and are suitable for either heavy or light work. The location is first-class in every respect.

This property is worthy the attention of manufacturers seeking a change of location or desiring to own their works. We will take pleasure in showing it to any such, assured that if it will meet the requirements we can induce them to purchase.

For terms and further particulars address

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NEW HAVEN, CONN.

**FOR SALE.**—One-quarter interest in one of the largest Hardware houses on the Pacific Coast, doing a heavy business and realizing a handsome profit; this business is, and always has been, in a prosperous condition, and seller can give the best of reasons for wishing to dispose of stock; to one taking an active part in the business a good salary can be obtained. For further particulars, address

"PACIFIC COAST,"

Office of The Iron Age, 66 & 68 Duane St., N. Y.

BEFORE BUYING

## MACHINISTS' TOOLS

OF ANY KIND

WRITE TO

**A. B. BOWMAN,**

823 North 2d St.,

ST. LOUIS, MO.,

**FOR REDUCED PRICES.**

## BARGAINS IN NEW MACHINERY.

Improved Cabinet, Hand, Fox, Monitor and Chucking Lathes, Planers, Vices, Chucks, &c.

AGENTS FOR

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W. F. & J. Barnes & Co.,

J. S. Wheeler & Co.,

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Send for illustrated circular just issued.

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23 and 25 Purchase St., Boston, Mass.

## FOR SALE:

Punching and Shearing Machinery.

Hand and Belt Power.

Boiler Makers' Rolls.

**NEW DOTY MFG. CO.,**

Janesville, Wisconsin.

FOR RENT OR FOR SALE.

## VALLEY FORGE MILL AND WATER-POWER

With new Dam and Flood Gates.

Situated at Valley Forge, Pa., on the Phila. and Reading Railroad, 25 miles from Phila. The buildings consist of a four-story stone Mill, L shaped, with tin roof, 28 stone Tenant Houses and stone Dry and Dye House. The water-power is known as one of the best in the State. The property was occupied for many years as a Woolen and Cotton Manufactory, but is adapted to general manufacturing purposes.

For particulars, address  
J. B. CARTER, Hardware Manfg. Agent,  
504 Commerce St. Philadelphia.

## Wanted to Buy,

SECOND-HAND LATHES, PLANERS AND SHAPERS. ALL SIZES. MUST BE IN GOOD ORDER AND CHEAP.

60-INCH LATHE WANTED AT ONCE.

POSDICK & PLUCKER,

SIXTH and CULBERT STS., CINCINNATI, OHIO.

## WANTED.

Wire Nail Plant; must be modern and cheap.

Address with full particulars,

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**FOR SALE.**—A full set Tinnerns' Tools, almost new; have not been used as much as to use steady three months; will give 35 off list; spot cash. Address

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FREE GIFT  
OF LAND

For Manufacturing  
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Located in  
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has the best harbor on the coast; coal by water  
direct from mines; exceptional shipping facili-  
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York, 124 miles; Boston, 108 miles; an excellent  
location for manufacturing and residence. Cor-  
respondence invited.

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**FOR SALE.**—A large and well-selected stock  
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Seeds, with all store fixtures and "good will";  
store is centrally located in a manufacturing  
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One-quarter interest in a manufacturing  
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**HARDWARE STOCK FOR SALE AT A SACRI-  
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business at a sacrifice; stock will invoice about \$5000.  
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We wish to sell our line of WAGON and CAR-  
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STOCK; the trade has been established for 80  
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A thoroughly established Hardware business,  
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## TO RENT OR FOR SALE ON EASY TERMS.

A manufacturing interest in first-class run-  
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can be purchased as needed on easy terms; loss  
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tory 120 feet long, 32 feet wide, two stories high,  
20-horse power engine, 40-horse power boiler, all  
in No. 1 condition; shop fitted with gas and steam  
throughout; correspondence solicited. Address  
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**WANTED.**—A reliable party to make and sell  
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# A MANUFACTURING CORPORATION

Having an extensive plant, including foundry,  
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The office and warehouse building lately  
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## FOR SALE CHEAP.

100 Tons Steel Strap Rail. Nearly new.  
3 Turn-tables, Hathaway Pattern. Nearly new.  
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# MANUFACTURERS OF HEAVY HARDWARE, METALS OR TOOLS OF ESTABLISHED REPUTATION

desiring to increase their business in the East-  
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## WANTED.

TRAVELING SALESMEN who are carrying  
special lines and visiting the Hardware and  
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on commission that is handled by this class of  
dealers; nothing new; no samples required.  
Address, stating territory,

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## FOR SALE. VALUABLE PATENTS FOR MEAT CHOPPER,

Chopper and Stuffer combined, Steam Auto-  
matic Stuffer, Nos. 274,115, 336,706 and 388,940.  
For price, address

MARKT & CO.,  
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## YOUR ATTENTION

Is called to the fact that we will license a Hard-  
ware manufacturer having facilities to make  
our new Carpet Stretcher on royalty; it is  
practical, of good design, and cheap to make.  
Also a new Can Opener, which overcomes a  
common difficulty. Address

E. C. ELLWOOD,  
Green's Farms, Conn.

62 John St.—Store, Basement  
and Sub-Cellar

to let or lease; will be put in thorough order;  
new plate-glass windows if desired: low  
rent. Apply to

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# MANUFACTURERS

Should locate in the West for  
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Des Moines, Iowa, offers extraordi-  
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Enterprises of all kinds.

Seventeen lines of rail-  
ways, low freights, cheap  
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Address

G. F. SELLECK, Secretary.

## NOTICE

TO HARDWARE MANUFACTURERS.

If you have any desirable specialties for which you  
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please address

J. B. CARTER,  
Hardware Manufacturers' Agent,  
504 Commerce Street, Philadelphia, Pa.

## JOB LOTS.

Do you want to buy or sell Job Lots of  
first and second quality tools for stand  
purposes, full line? If so, please an-  
swer, and we will send samples of  
special goods. Second quality Files a  
specialty.

C. WEILAND,  
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## Notice to Manufacturers.

St. Louis Representation.

We would like to correspond with manufact-  
urers in regard to representing, as resident  
salesmen, a few staple lines in this city and  
vicinity. Address

B. G. FARRAR & CO.,  
620 North Main street, St. Louis, Mo.

## EUGENE BISSELL, Auctioneer. HAYDOCK & BISSELL,

Successors to  
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WHOLESALE  
HARDWARE AUCTIONEERS,

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Sales held weekly for the trade. Consignments sol-  
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can be cheaply made by the use of DIXON'S  
PLUMBAGO FACINGS. Send for circular.

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## NOTICE TO BRIDGE BUILDERS.

Sealed proposals will be received by a Committee of the Board of Freeholders of Hunterdon County, N. J., at Flemington, N. J., on Wednesday, July 3d, until 2 o'clock p.m., for the erection of a Wrought-Iron Bridge of 81 ft. span in Lebanon Township, at Trimmers Mill. Specifications will be furnished on application to P. H. Hartwell, Lambertville, N. J.

P. H. HARTWELL,  
JOHN FRITTS,  
A. C. APGAR,  
CHAS. OPEDYKE,  
J. W. JOHNSON,  
WM. H. RHINEHART,

Dated June 20, 1889.

Committee.

## PATENTS.

Until **October 1st**, my fees, as attorney, due only on allowance if desired. Write

W. H. BABCOCK.  
513 Seventh St., Washington, D. C., P. O. Box 220.  
Formerly Examiner in Patent Office.  
THIRTEEN YEARS' PRACTICE.

## BESSEMER IRON ORE.

600 miles from Philadelphia by sailing vessel. Analyzed, phosphoric acid, .01; metallic iron, 59; can be delivered under \$3.50 per ton; will sell half-interest low to working capitalist.

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## FOR SALE.

Cheap, two second-handed rolls for rolling out 1/2 oval iron, three rolls with the machine complete, five extra rolls, size 11 inches in diameter, 20-inch long and for 6-inch box; also a very large upsetting machine for throwing hot iron into different shapes, commonly called Headers. Address

"HEADERS,"

office of *The Iron Age*, 66 and 68 Duane st., N. Y.

## FOR SALE.

A well-established Hardware, Mill and Builders' Supply Business, in a growing manufacturing town of 12,000 inhabitants in Western Pennsylvania; stock about \$6000; two railroads through town; doing a good business; satisfactory reasons given for selling. Address

"BUILDERS' SUPPLY,"

office of *The Iron Age*, 66 and 68 Duane st., N. Y.

## RARE CHANCE.

FOR SALE.—Canadian Patent No. 9251, for Steam and Hot-Water Radiators; in use for three years in the United States; is being manufactured by several large concerns on a royalty; a good investment; will sell the entire Dominion of Canada, which can be worked or sublet on royalty or shop right by owner; have all I can do to attend in U. S. For full particulars address

"RADIATORS,"

office of *The Iron Age*, 220 S. Fourth street, Philadelphia.

## FOR SALE.

Complete set of Patterns for making door locks, knobs and builders' hardware; an excellent opportunity for any party contemplating manufacturing in the South or elsewhere.

"HARDWARE MANUFACTURER,"

office of *The Iron Age*, 66 & 68 Duane st., N. Y.

## HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

WANTED.—An active and persevering man of good character to travel and solicit orders for steam-engines and general machinery. Address, stating age, experience and salary expected, "HOMO FERRO," office of *The Iron Age*, 66 and 68 Duane street, New York.

WANTED.—A Salesman to call on the builders' hardware trade from New York to Washington, D. C.; the goods are already well and favorably known. "KNOB LOCKS," office of *The Iron Age*, 66 and 68 Duane street, N. Y.

WANTED.—A competent Founder to take charge of two (2) Blast Furnaces; none but experienced men need apply. Address EUREKA Co., Oxmoor, Ala.

WANTED.—A good Mechanical Engineer and Head Draftsman, capable of taking charge of drawing office, designing of machinery and putting work into shops. A young man of good business qualities, energy and intelligence can secure a good position. Address, giving name, age, experience, where employed, &c., "S," Lock Box 1086, Philadelphia.

WANTED.—Traveling Salesman, one well acquainted with the jobbing hardware trade throughout the West, to represent a reliable and well-established hardware manufacturing concern; would prefer man to take active interest and invest from \$3000 to \$5000 in business. Address "EDWARDS," office of *The Iron Age*, 66 and 68 Duane street, New York.

SALESMEN WANTED.—Wanted Salesmen to sell in Southern Pennsylvania, Ohio, Indiana, Illinois and Michigan, tin-plates, tinner's supplies and plumbers' supplies on commission; any stove salesman who has a little surplus time in each town can make a moderate increase in his earnings and strengthen his own position with his trade, as the line of goods we offer is large. Address "TIN PLATES," office of *The Iron Age*, 66 and 68 Duane street, New York.

TRAVELING SALESMEN WANTED.—COMPETENT, ENERGETIC AND PUSHING SALESMEN to sell a line of special goods well known to the Hardware, Stove and House-Furnishing Trade; must be familiar with the Hardware Business, and experienced in selling goods on the road, and furnish first-class references. Other lines not conflicting can be taken. Liberal commission. Address "Box 141," Manchester, N. H.

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WANTED.—A position as Foreman in a foundry; have had 16 years' experience in foundries engaged in the manufacture of mining and general machinery; can furnish good references as to ability, &c. Address "FOREMAN," Pottsville, Schuylkill Co., Pa.

A YOUNG MAN with seven years' experience in office and stock work in a wholesale hardware house desires a situation as book-keeper or general clerk; can refer to employers for reference. "A. B. C.," office of *The Iron Age*, 66 and 68 Duane street, New York.

YOUNG MAN with eight years' experience in the brass and white metal goods line desires a position as Manager or Foreman, being a thorough machinist and having the ability to invent and improve on machinery and tools; best references. Address E. W. GRAEF, 399 Dean street, Brooklyn, N. Y.

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WANTED.—Situation as manager of blast furnace (coke); have had 18 years' experience and can give best of reference; can go to any part of the country. Address THEODORE SMITH, Sixth ward, Steubenville, Ohio.

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A COMPETENT gentleman having 16 years' experience in the manufacture of lock and builders' hardware, gray, malleable and brass castings, wishes a position as Office Manager or Assistant; is competent to get up costs, understands foreign languages and is familiar with the export trade. Address "VULCAN," office of *The Iron Age*, 66 and 68 Duane street, N. Y.

THE STEEL TRADE.—Situation wanted as works manager, to have entire charge of Steel works; 23 years' experience in the Steel trade, and employed as works manager for several years. Address "S. S. L.," care of Advertising Office, 163 Queen Victoria street, London, E. C.

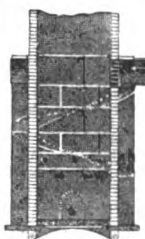
WANTED.—Position by gentleman with long experience in the machinery and supply business both on the road traveling and in the office; would represent some manufacturing traveling, or stay in office or store; have a large acquaintance; best of references. Address "LAWRENCE," office of *The Iron Age*, 66 and 68 Duane street, New York.

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PIECED WARE. [Card No. 26-A.]					
DESCRIPTION.	Size or No.	List.	Cost.	Job.	Sell.
BOILERS.					
COFFEE,	7 in.				
Bailed and	8 "				
Copper Bottom.	9 "				

tough, heavy card board, especially adapted for this use, protected on the edges by being cloth-bound, which saves framing. Two-thirds of them are 3 x 13 1/4 inches. This size has been found convenient for hanging on a pilaster finish, or on any narrow surface, without hiding the goods. To hang or chain up each card, there is firmly inserted through the nickel-plated eyelet about 3/8 inch inside diameter. The comparative numbers of the different makers of cabinet and padlocks, rules, levels, etc., have been carefully corrected to the date of issue and many numbers added. Most houses require 6 to 12 cards extra, of each Nos. 32 and 33, to price lines not covered by the other numbers.

## DESCRIPTION AND PRICES.

Card No.	Description	Size and Price per Card.	Card No.	Description	Size and Price per Card.
1	A—Bar Iron, Weight of Round, Square and Flat, per Foot and Tire per set. Western Classification and Prices of Extras on American, Norway and Swedes.	5 1/2 x 18 in. 40 Cts.	23	A—Hooks, Coat and Hat, Wardrobe, School-house, Har-ness, Clothes-line.	3 x 13 1/4 in. 30 Cts.
2	B—Bar Steel, All kinds and Sizes with Prices of Extras. Horse and Mule Shoes, Size, Weight, No. in Keg. Toe Calks. Cut Nails, List of Extras.	3 x 13 1/4 in. 30 Cts.	24	B—Shelf Brackets. Drawer Pulls.	3 x 13 1/4 in. 30 Cts.
3	A—Cut Tacks, exact size cuts. Length. Number in a lb.	3 x 13 1/4 in. 30 Cts.	25	A—Wood Planes. Plane Irons, Cut and Double.	3 x 13 1/4 in. 30 Cts.
4	B—Large Head Carpet Tacks. Gimp and Lace Tacks. Hungarian Nails, Hob Nails, Blued and Tinned, American and Swedes. Exact size cuts shown of all the above.	3 x 13 1/4 in. 30 Cts.	26	B—Patent Planes. Patent Plane Irons.	7 x 22 in. 60 Cts.
5	A—Shoe Nails. Cigar Box Nails. Copper Tacks. Double-Pointed Tacks and Cuts, Glaziers' Points and Cuts. Barbed Blind Staples.	3 x 13 1/4 in. 30 Cts.	27	A—Woodenware and Baskets. Alphabetically arranged.	7 x 22 in. 60 Cts.
6	B—Patent Brads. Finishing Nails. Blued Clout Nails. Tinned Clout Nails.	3 x 13 1/4 in. 30 Cts.	28	B—Woodenware (contd.) Alphabetically arranged.	7 x 22 in. 60 Cts.
7	A—Iron Wood Screws.	6 x 16 in. 40 Cts.	29	A—Pieced Tinware. Alphabetically arranged.	7 x 22 in. 60 Cts.
8	B—Iron Wood Screws (contd.) Iron Machine Screws.	3 x 13 1/4 in. 30 Cts.	30	B—Stamped Tinware. Alphabetically arranged.	7 x 22 in. 60 Cts.
9	A—Standard Carriage Bolts.	3 x 13 1/4 in. 30 Cts.	31	A—Japanned Tinware. Alphabetically arranged.	7 x 22 in. 60 Cts.
10	B—Standard Carriage Bolts (continued.) Plow Bolts.	3 x 13 1/4 in. 30 Cts.	32	B—Granite or Agate Ironware. Planished Ware. Stove and Hollow Ware. All Alphabetically arranged.	7 x 22 in. 60 Cts.
11	A—Machine Bolts.	3 x 13 1/4 in. 30 Cts.	33	A—Mortise Door Locks, Latches, Knobs and Escutch-ions.	7 x 22 in. 60 Cts.
12	B—Standard Tire Bolts. Round and Flat Head Stove Bolts.	3 x 13 1/4 in. 30 Cts.	34	B—Rim Door Locks, Latches, etc.	7 x 22 in. 60 Cts.
13	A—Philadelphia Carriage Bolts.	3 x 13 1/4 in. 30 Cts.	35	A—Padlocks, Japanned, Wrought Iron, Bronzed Iron, Brass and Jail.	6 1/2 x 22 1/2 in. 60 Cts.
14	B—Philadelphia Carriage and Tire Bolts.	3 x 13 1/4 in. 30 Cts.	36	B—Complete Comparative List of Corresponding Numbers of Padlocks, Mallory, Wheeler Co., Wm. Wilcox Mfg. Co., Russel & Erwin Mfg. Co., Norwich Lock Mfg. Co., Nimick & Brittain Mfg. Co. Revised to July, 1885.	7 x 24 in. 60 Cts.
15	A—Square and Hexagon Nuts. Wrought Washers. Size of Bolt, size of Hole, Width, Thickness, number in 100 lbs.	3 x 13 1/4 in. 30 Cts.	37	A—Cabinet Locks, Drawer, Chest, Cupboard and Trunk. Cabinet Keys.	7 x 24 in. 60 Cts.
16	B—Coach or Lag Screws. Superior and Norway Axle Clips.	3 x 13 1/4 in. 30 Cts.	38	B—Complete Comparative List of Corresponding Numbers of Cabinet Locks, Eagle, Corbin, Parker, Gaylord. Revised to July, 1885.	7 x 24 in. 60 Cts.
17	A—Bright Screw Hooks. Belt Hooks. Blake's Belt Studs.	3 x 13 1/4 in. 30 Cts.	39	A—Length and number of Nails to the pound. Number of feet in a bundle of Hoop, Scroll and Band Iron. Number of feet of Wire in a pound. Coil or Cable Chain, weight per foot and proof in tons. Bright Coil and Halter Chain and corresponding No. of Wire. Sash weights and line required for common sized window.	6 x 22 in. 60 Cts.
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19	A—Plate Casters and Bed Casters.	3 x 13 1/4 in. 30 Cts.		Is adapted for filling in with any line of goods. It is ruled both sides with columns headed respectively— "Description," "Size or No.," "List," "Cost," "Job," "Sell."	4 x 7 in. 10 Cts.
20	B—Wrought Hooks and Staples. Trap Door Rings. Hasps and Staples, and Staples only.	3 x 13 1/4 in. 30 Cts.		As No. 32, but half size, for smaller lines of goods.	5 1/2 x 9 1/4 in. 30 Cts.
21	A—Saws. Hand, Panel and Rip. Combination and Back. Disston's and W. M. & C.'s corresponding numbers and "Our Brand."	3 x 13 1/4 in. 30 Cts.		A—Wire Nails, Exact Size Cuts.	5 1/2 x 9 1/4 in. 30 Cts.
22	B—Saws. Back, Compass, Pruning, Kitchen, Butchers' Bow and Blades. Framed Wood Saws and Blades.	3 x 13 1/4 in. 30 Cts.		B—Wire Nails, List Prices and Number in a pound.	5 1/2 x 9 1/4 in. 30 Cts.
	A—Chisels. Slicks, Socket Framing, Socket and Tanged Firmer, Corner.	3 x 13 1/4 in. 30 Cts.		A—Gas Pipe, Black and Galvanized. List Prices. Weight per foot and number threads per inch of screw. Also Malleable Pipe Fittings illustrated.	5 1/2 x 9 1/4 in. 30 Cts.
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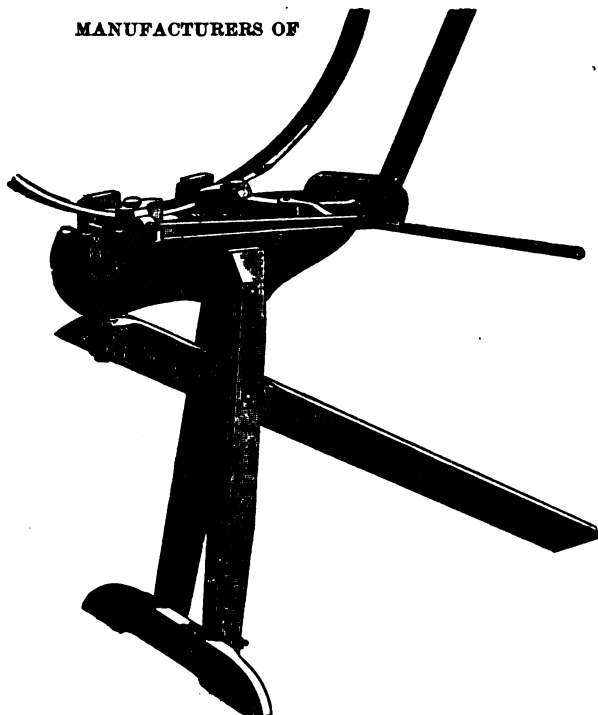
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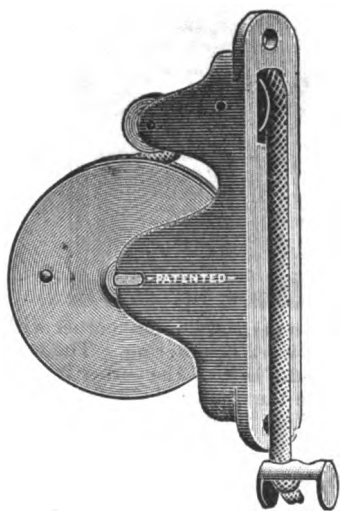
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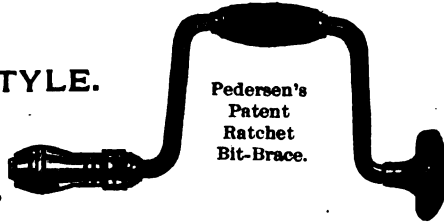
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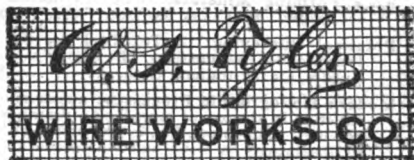
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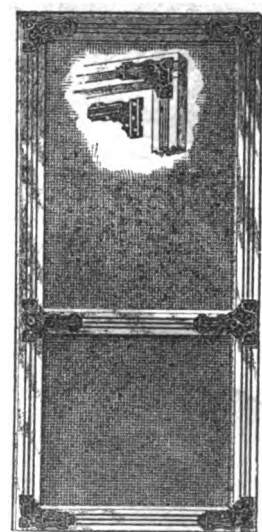
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The window may be raised or lowered while the screen remains in place.

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25 6 x 8 to 10 x 15....	\$18.00	\$12.50	\$12.00	\$11.50
40 11 x 14 to 16 x 24....	16.00	15.00	14.50	....
50 18 x 22 to 20 x 30....	20.50	19.50	18.50	....
54 15 x 26 to 24 x 30....	21.00	20.75	19.50	....
60 26 x 28 to 24 x 36....	25.00	23.00	21.50	....
70 26 x 28 to 26 x 44....	26.00	25.00	23.00	....
80 26 x 46 to 30 x 50....	28.00	26.50	24.50	....
84 30 x 52 to 30 x 54....	30.00	28.00	26.00	....
90 30 x 56 to 34 x 56....	31.00	30.00	28.00	....
94 34 x 58 to 34 x 60....	32.50	31.00	29.00	....
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Sizes above—\$15 per box extra for every 5 inches  
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Price Per Box of 50 Feet.

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50 18 x 22 to 20 x 30....		15.50	14.00	13.00	12.50
54 15 x 26 to 24 x 30....		16.50	15.00	13.50	....
60 26 x 28 to 24 x 36....		17.75	16.25	14.75	....
70 26 x 28 to 26 x 44....		19.00	17.50	15.25	....
80 26 x 46 to 30 x 50....		21.00	19.50	17.00	....
84 30 x 52 to 30 x 54....		22.00	20.25	18.00	....
90 30 x 56 to 34 x 56....		23.00	21.25	19.00	....
94 34 x 58 to 34 x 60....		24.00	22.75	21.00	....
100 36 x 60 to 40 x 60....		26.50	24.50	23.00	....

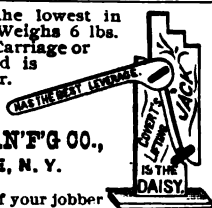
United Inches.	Sizes.	Double.			
		AA	A	B	C
25 6 x 8 to 10 x 15....		\$18.00	\$12.50	11.00	\$10.00
40 11 x 14 to 16 x 24....		16.00	15.00	13.50	12.00
50 18 x 22 to 20 x 30....		20.50	19.50	18.00	....
54 15 x 26 to 24 x 30....		22.00	20.75	18.75	....
60 26 x 28 to 24 x 36....		25.00	23.00	21.00	....
70 26 x 28 to 26 x 44....		26.00	25.00	22.50	....
80 26 x 46 to 30 x 50....		28.00	26.50	23.75	....
84 30 x 52 to 30 x 54....		30.00	28.00	25.25	....
90 30 x 56 to 34 x 56....		31.00	30.00	27.00	....
94 34 x 58 to 34 x 60....		32.50	31.00	28.00	....
100 36 x 60 to 40 x 60....		36.00	32.50	30.00	....

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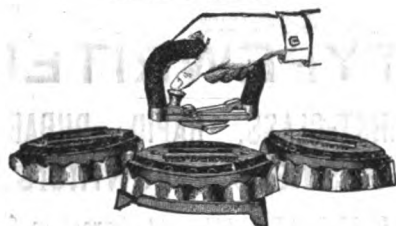
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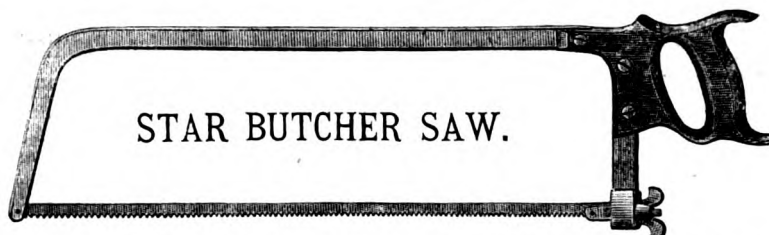
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A Common Butcher's Saw Blade costs 50 cents; it is usually filed about 150 times, and at a cost of 10 cents a time, \$15.00. Two dozen Star Butcher Saw Blades will do the same amount of work they cost \$1.32 per dozen and are never to be filed. If the dealer makes 25 per cent.

In selling 24 Star Blades for \$2.64 he gets - - - - - 66c.  
" " 1 Common " " .50 " " - - - - - 12½c.

A clear gain of - - - - - 53½c.

The Butcher pays for 1 common blade and filing, - - - - - \$15.50  
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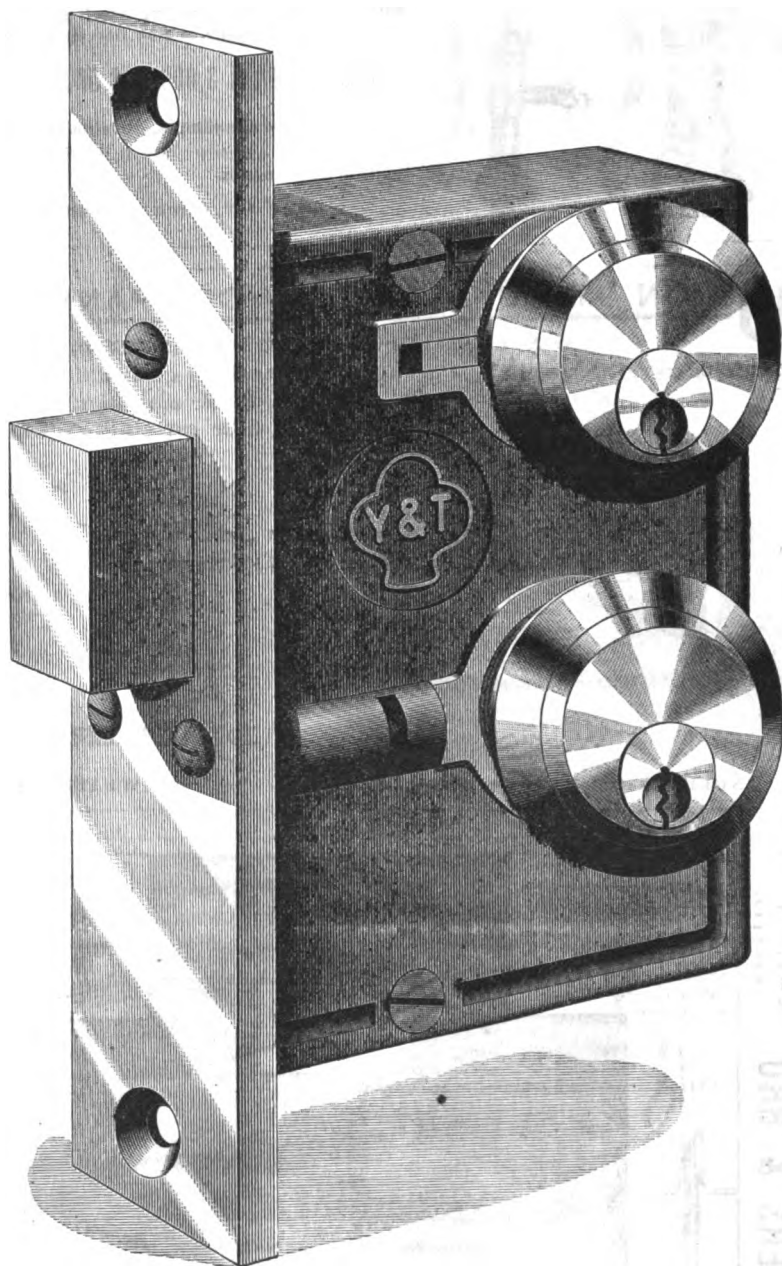
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Fig. 190.



Fig. 70.



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Fig. 200.



Fig. 381.



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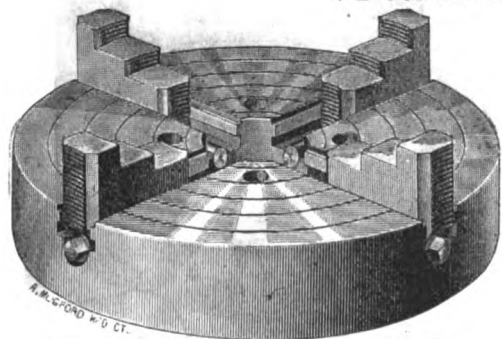
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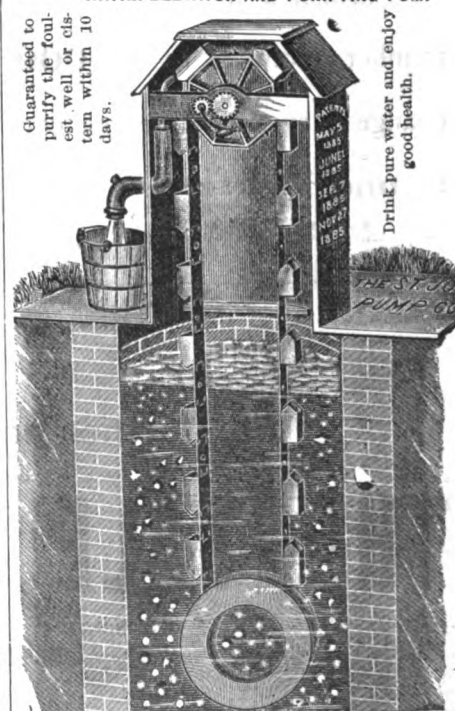
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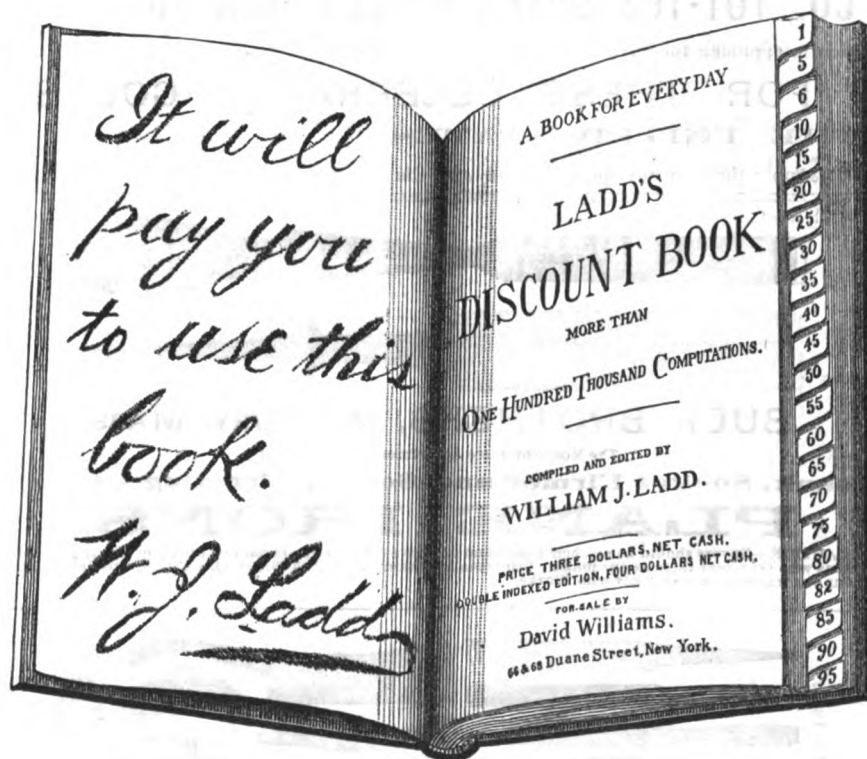
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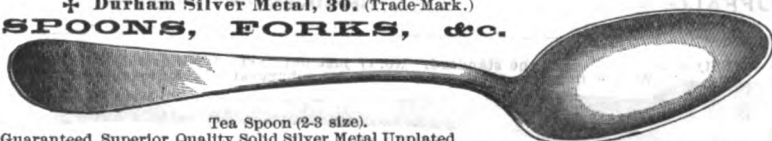
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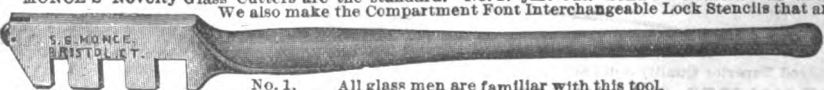
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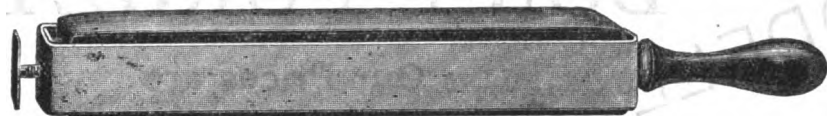
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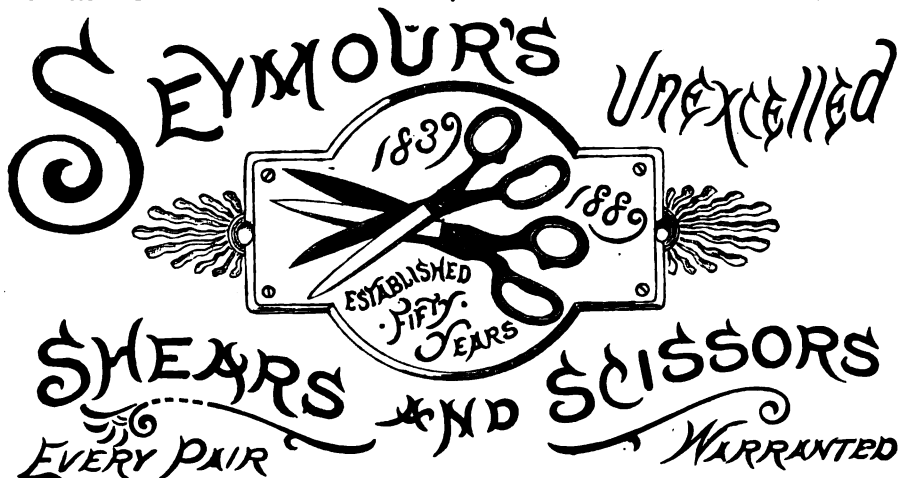
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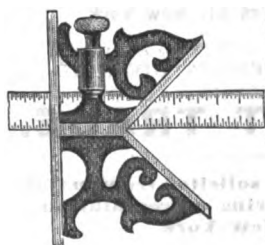
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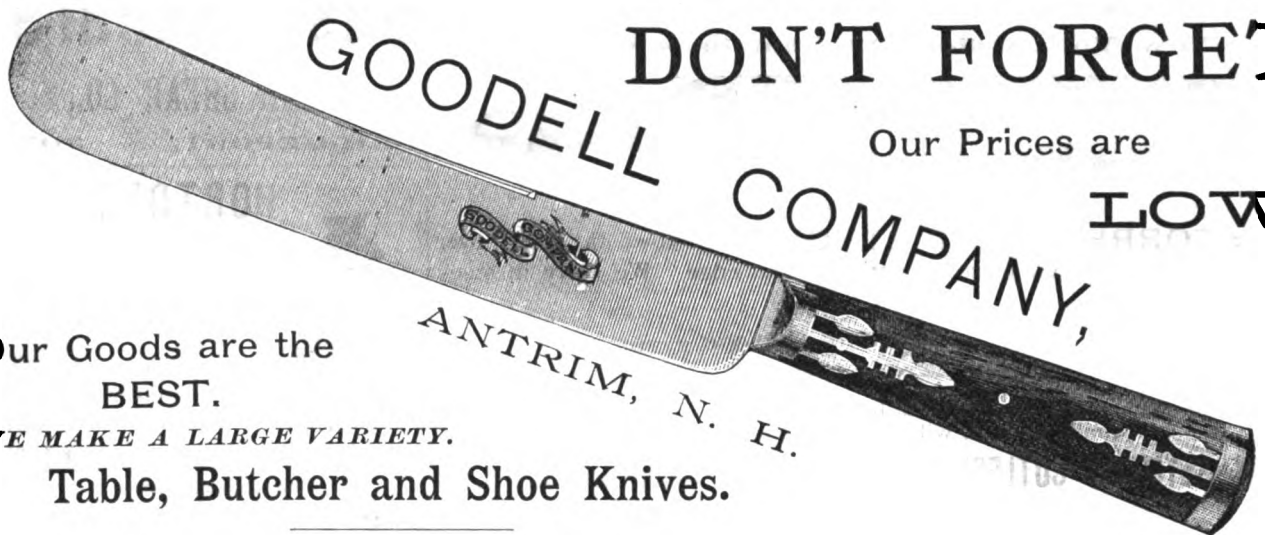
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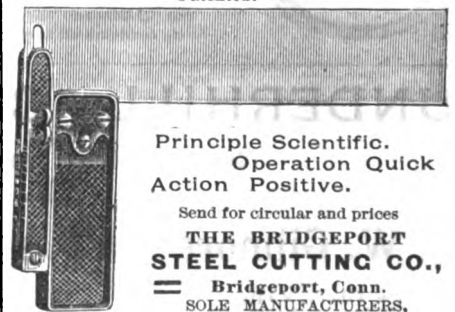
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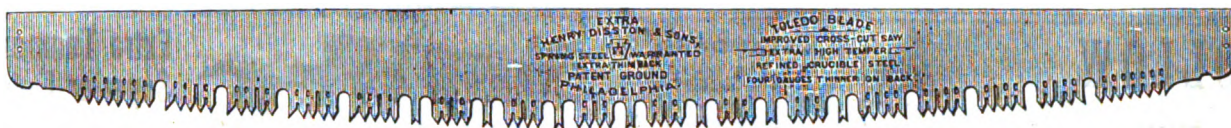


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**TOLEDO BLADE.**

Why the Toledo Blade is the Best Working Saw in the Market.

Because it is ground by improved machinery, which insures an even gauge throughout and a true taper from teeth to back, making it four gauges thinner. It is made from the best tough crucible steel, and if properly sharpened will work with little or no set.

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This saw is of even gauge from end to end, and ground five gauges thinner throughout the entire back than on the teeth, and will retain its gauge as the saw wears narrow, which feature no other saw possesses.

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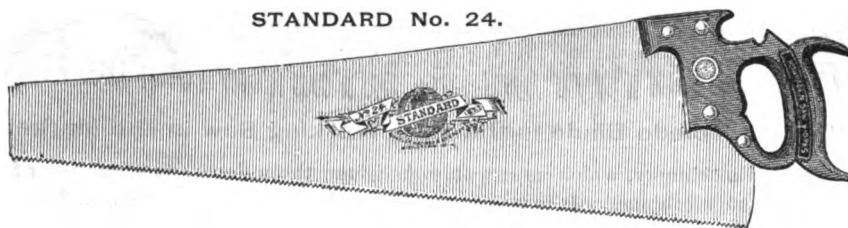


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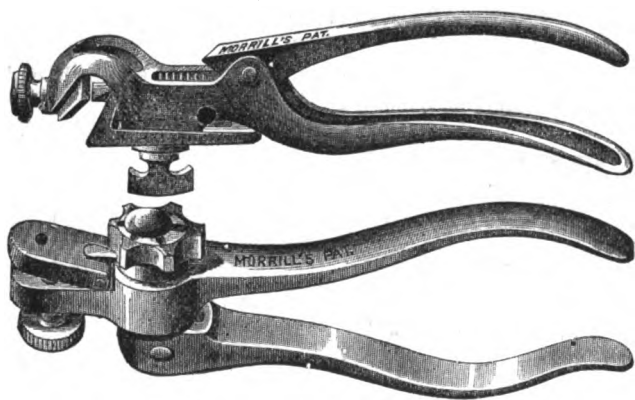


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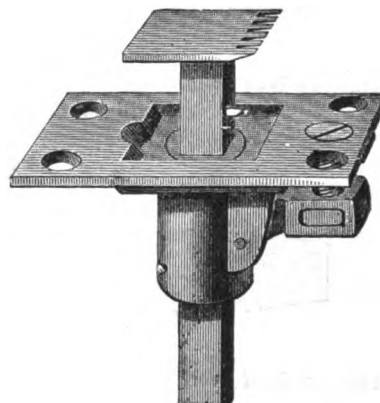
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Perfect Saw Sets  
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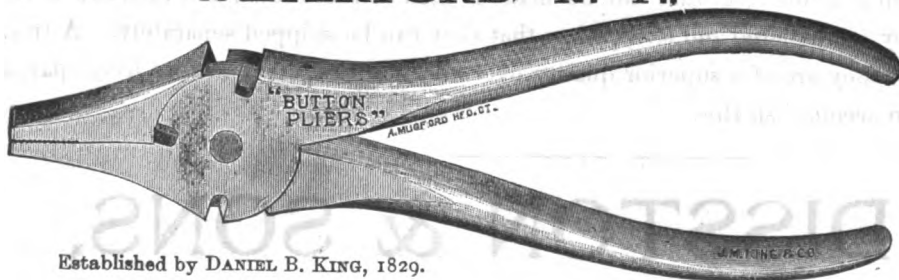
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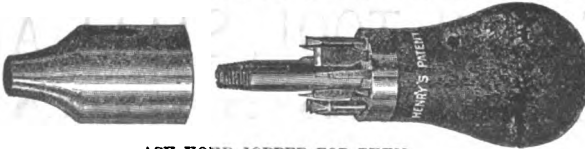
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MAKERS OF  
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containing seven Brad-Awls,  
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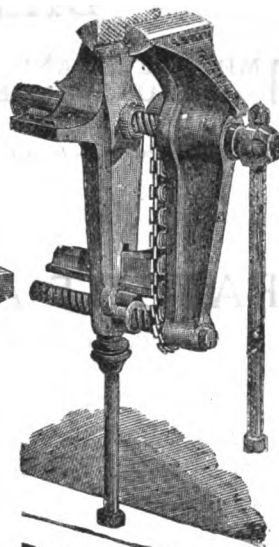
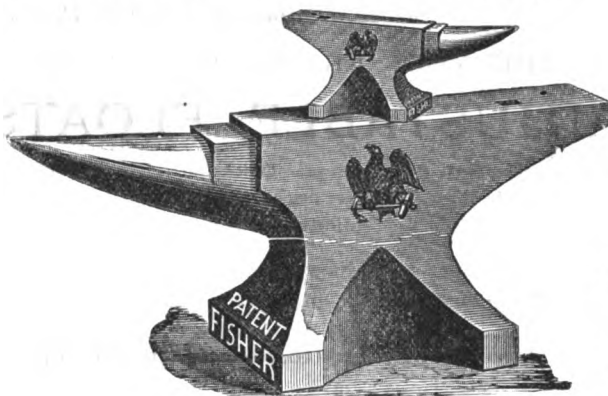
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Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough untempered steel, never to break or bend. Only Anvil made in United States fully warranted as above.

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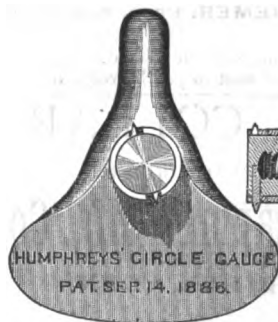
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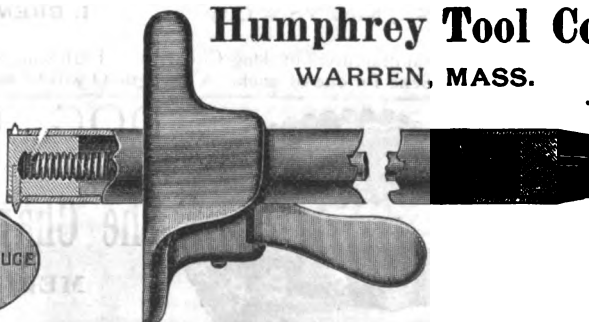
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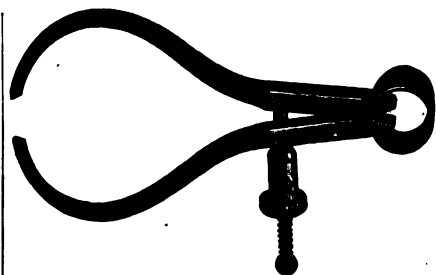


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"This gauge will scratch a line on straight or curved edges. The marking tooth is equal distances from the face of gauge or post on opposite side thus adapting it to curves. Head held in place by lever and tooth moved by adjusting screw as shown. Cuts full size. Send for prices."



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Now sell their own goods (the selling agency having been withdrawn).

They invite the attention of the trade to their well-known

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Augers in all the usual sizes and styles.

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All our tools are branded "New Haven Copper Co.," which is a guarantee that they are of the best quality and finish.

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*Sole Selling Agents for Skinner's Celebrated Fluted Trolling Spoon Baits, in Gold,  
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THE MOST KILLING BAIT IN THE WORLD.

## PATENT ADJUSTABLE FLOATS and SINKERS.

Enameled and thoroughly water-proof. Very buoyant. Quickly attached or detached without knotting or tying or removing the hook from the line. Wherever placed will remain securely fastened; easily removed and adjusted to any part of the line.

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## THE VINEYARD BICYCLE. STRONG, DURABLE AND CHEAP.

As good as the best for road and business purposes. For boys and men.

Diameter Front Wheel.	Front Tire.	Diameter Rear Wheel.	Rear Tire.	Weight all on.	Length of leg inside to sole of foot.	Price.
38 inch	3/4 inch	14 inch	3/8 inch	31 lbs.	27 inch	\$27.50
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46 inch	3/4 inch	16 inch	3/8 inch	38 lbs.	31 inch	35.00
48 inch	3/4 inch	16 inch	3/8 inch	39 1/2 lbs.	32 inch	37.50
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Parties wishing small specialties or novelties manufactured from metal are requested to correspond with us.

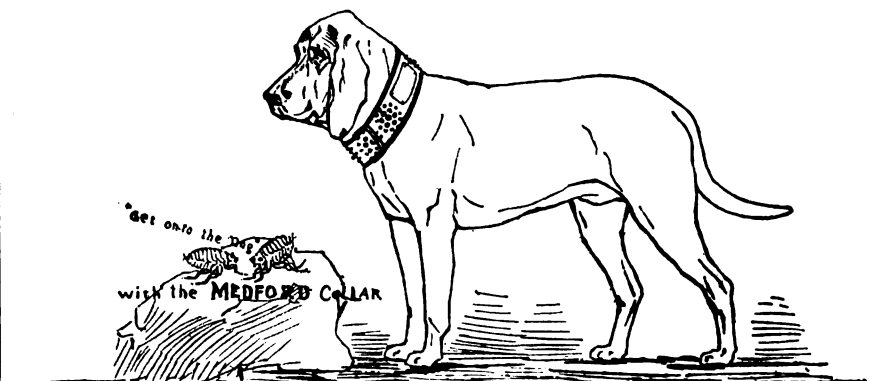
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ALSO  
Cotton and Bale Hooks.  
Patented Feb. 13, 1877, a new  
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**MEDFORD FANCY GOODS CO.,**

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I. BREMER, Pres. and Treas.

The only exclusive manufacturers of Dog Collars and Furnishings in the World. Ten thousand styles. Send for one of each. Catalogue O will be sent to you by request.



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Over 100 new styles never before put on the market, at low prices.



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Blowers, Forges, Drills, &c.JOHN AUER, JR.,  
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No. 25 BEAVER STREET, NEW YORK,

SELLING AGENTS FOR

## DOUGLAS AXE M'F'G CO., - BOSTON, MASS.,

And Representing Direct

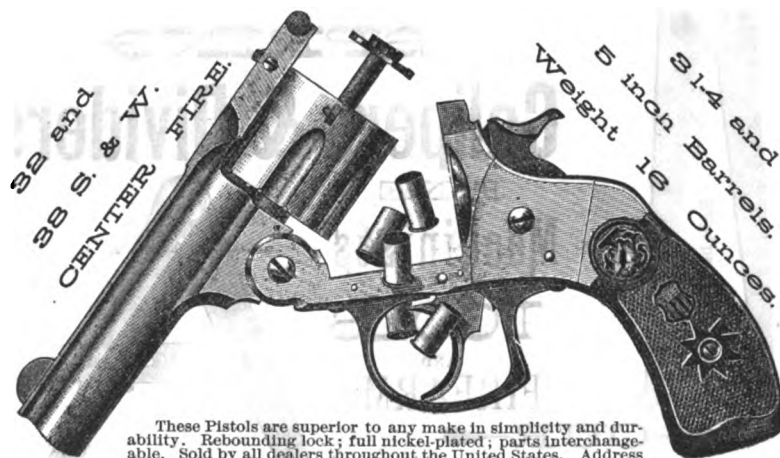
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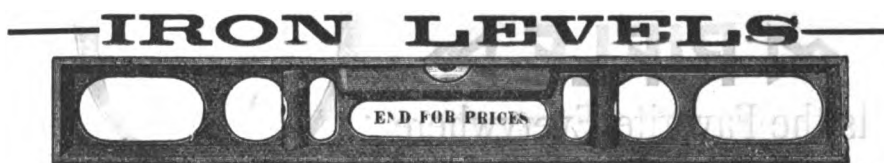
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### FOREHAND & WADSWORTH'S AUTOMATIC DOUBLE-ACTION REVOLVER.



FOREHAND &amp; WADSWORTH, - Worcester, Mass.



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### AMERICAN SCREEN WIRE HOLDER,

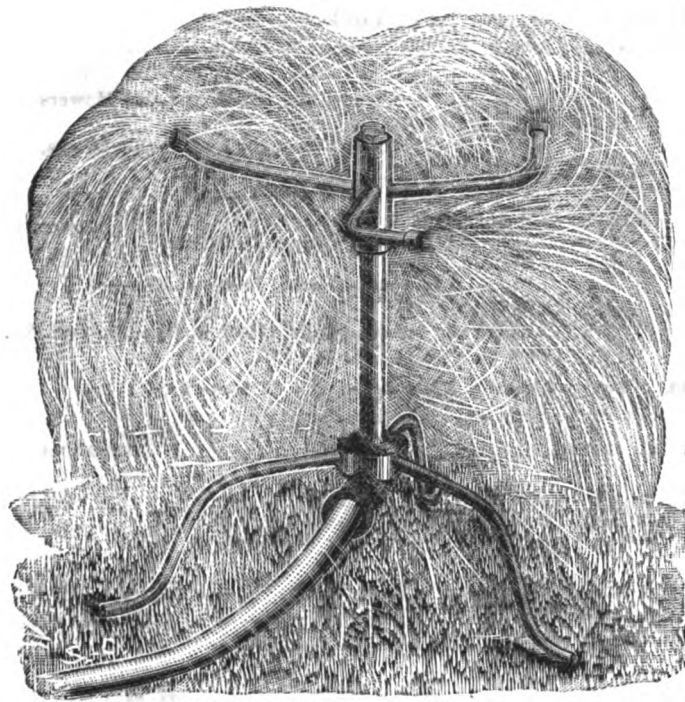
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Arranged to hold seven rolls of Wire of different widths; no trouble to load the Holder with Wire. Send for descriptive circulars and testimonials. Mention *The Iron Age*.

SEYMOUR SMITH & SONS., Oakville, Conn  
Pruning Shears. Send for Illustrated Catalogue.

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In presenting to you our California Lawn Sprinkler we desire to call your attention to the fact that it is made on scientific principles, and is not made simply TO SELL, but to give satisfaction to the consumer. It is now so much thought of that it is rapidly superseding all other Lawn Sprinklers.

We warrant them to last for years running daily. The bearings are babbitted with the best babbitt metal, and will not leak, wear, or get out of order. From being babbitted with anti-friction metal, it will run with very light pressure, and will water a space of from twenty to sixty feet square evenly, according to the pressure applied. It is a great water economizer. It is the only babbitted Lawn Sprinkler in use. Weight, 3 lbs. Height, 18 inches.

Order sample and convince yourself that at last a good, low-priced Sprinkler has been invented.

Price, \$30 per dozen. Discount to the Trade.

SAMPLE BY EXPRESS, \$3.00.

For Sale by the Trade generally.

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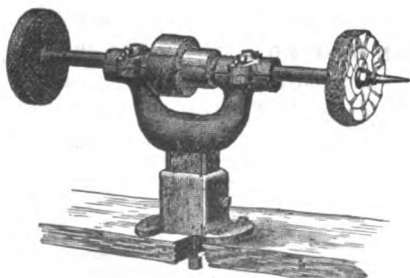
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SPINNING LATHES, CIRCULAR SAWS, &c.

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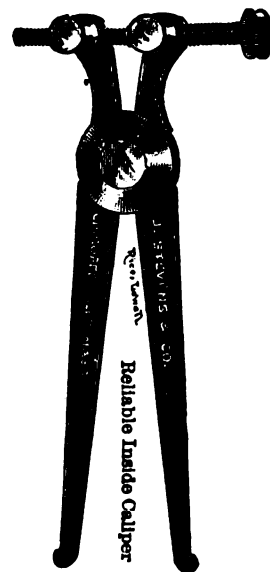
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TOOLS  
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FIREARMS.



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Is the Favorite Everywhere

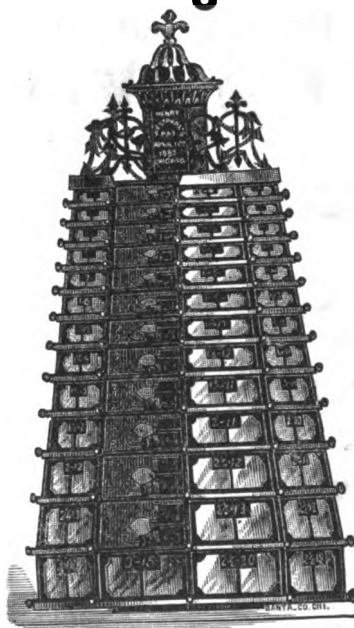
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 Measuring Faucet.	 Bone, Shell & Corn Mill.	 Coffee and Spice Mill.	 Bung-Hole Boer.	 Cheese Knife.	 Smoked Beef Shaver.
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 No. 5 Meat Chopper.	 No. 10 Meat Chopper.	 No. 22½ Meat Chopper.	 Showing Meat Chopper Taken Apart.	 No. 52 Meat Chopper.	 No. 62 Meat Chopper.

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### Advantages in Using.



Improved Revolving Screw Case. Made Entirely From Iron and Glass.

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(Successors to HENRY WESTPHAL),

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Agent for New York and New England States.

This advertisement appears every other week.

## GEM OILER.

Patented February 8, 1880.

The oiler is made of heavy flint glass—strong, clean and durable; filled with the best of oil. It has a metallic top (the bottom is glass), with a flexible chamber with which to squirt the oil. The cap is screwed on to the bottle, making the oiler absolutely leakless.

Being transparent, the quantity of oil in or being poured into the oiler can be seen at a glance, thus enabling you to fill without spilling the oil. Having the bottom and sides all in one piece and of glass, they are perfectly clean, with no spring bottom to leak or come out.

They are sold so cheap that they can be sold again at about the price of a bottle of good oil alone.

To the dealer it is a most convenient article and ready seller.

With the consumer it is a most desirable arrangement, as it enables him to get an oiler with his oil, and a splendid oiler, too.

In using—Place your thumb on the bottom of the oiler, letting the spout pass between the fingers. To squirt the oil, press down on the washer around the spout. This gives a better flow than a spring-bottom oiler, and is easier regulated.

They are sold by Grocers, Stationers, House-Furnishers, Druggists, Hardware Merchants, Novelty Dealers, Type-writer Dealers and Sewing-Machine Dealers.

## PAINE, DIEHL & CO.

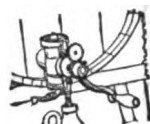
Philadelphia, Pa.



## THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental and, workmanship of the very best. We make more than 30 styles.



### Lane's Measuring Faucet.

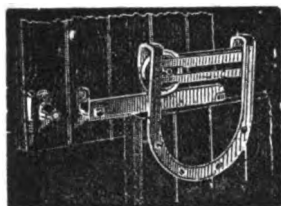
## LANE'S PATENT STEEL DOOR HANGER.

*The most perfect Anti-Friction Hanger in the Market, because*

It is made of steel throughout, except the wheel, which has a steel axle. It will not break. It is practically free from wear. It is almost noiseless in action. It requires no oil. It has a broad bearing on the door, and keeps in line. It is by far the most durable. It may be used with any track. It is always in order. LANE'S PATENT TRACK is made of steel and is easily put in position. Catches and holds no snow or ice. Door hung thereon cannot jump the track. Is not subject to decay. Requires no fitting, but is ready at once. May be used with hangers of other manufacture. Send for circulars.

Manufactured by **LANE BROS.,** Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers Street, NEW YORK.



## REFRIGERATORS



### The Leonard Cleanable Dry-Air Refrigerators.

Best in the world. Others may claim to be as good, but they are NOT. They all lack the special improvements which can be found only in the LEONARD CLEANABLE. Removable Flues, Air-Tight Locks, Solid Iron Shelves, Five Walls, Moisture Condenser, &c. Hardwood, Antique Finish. Send for catalogue. Secure the agency. Freight allowance liberal.

GRAND RAPIDS REFRIGERATOR CO.,

SOLE MANUFACTURERS,  
GRAND RAPIDS, MICHIGAN.

### CHANDLER'S

## ICE CUTTING MACHINE.

Over 12,000 in Actual Use.



MADE IN FOUR SIZES.

No. 1, for Bar Tops and Soda Counters.

No. 2, for Family and Universal Use.

No. 2½, for Hotels, Hospitals and Boarding Houses.

No. 3, for Large Hotels, Confectioners, &c.

**WANTED,** one Hardware Merchant in every city to act as Agent.

ADDRESS

**G. IRVING ABENDROTH,**

No. 28 Cliff Street, New York.

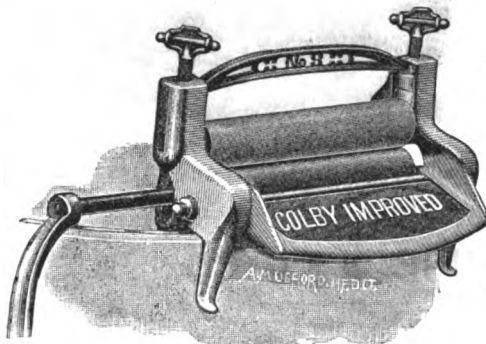
## The Peabody Door Spring.

The only low-priced Scientific Door Spring made: exerts its greatest power at the latch. Equally desirable for Screen Doors, House Doors, or Store Doors.

Circulars and Price Lists on application.

A. W. PAINE, Peabody, Mass.

## THE COLBY IMPROVED WRINGER.



Galvanized Malleable Iron Frame.

Best Patent Rolls. Metal Bearings. No Clamp screws to adjust. Fits any tub.

FULLY WARRANTED.

MANUFACTURED BY

**COLBY WRINGER CO.,**

MONTPELIER, VT.

BOSTON—29 Cornhill. CHICAGO—68 Lake St.

Send for Price List.



**SUPERIOR** to other ware because it does not RUST, SOAK OR FALL TO PIECES, yet is LIGHT, STRONG, CLEANLY. Our plain goods are STAPLE and our No. 5, HAND-DECORATED, UNIQUE, ARTISTIC and **Good Sellers.** Sell STANDARD FIBRE-WARE and your customers will tell their neighbors where to buy these ELEGANT UTENSILS and that they are **The Best.** NONE GENUINE WITHOUT OUR TRADE-MARK on bottom. See prices in hardware quotations.



## TRIUMPH CHAINS.

**"TRIUMPH" WIRE CHAINS,** Halter Chains, Dog Chains, Kennel Chains, Coll Chains, &c.; the most perfect Chains made for their various purposes; made of Steel Wire and possess great strength; much lighter than sheet metal or welded chains; no sharp edges; do not kink; no bad welds; in fact the most saleable and serviceable chains the trade can handle. Also "Monarch" Sash Chain, Plumbers' Safety Chains, &c. Send for catalogue.

THE BRIDGEPORT CHAIN CO., Bridgeport, Conn.

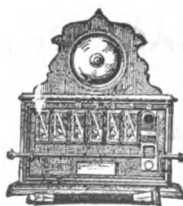
## W. R. OSTRANDER & CO.,

21, 23 & 25 ANN STREET, NEW YORK.

Manufacturers of

SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC, MECHANICAL & PNEUMATIC ANNUNCIATORS & BELLS.

Complete Outfits of Speaking Tubes, Whistles Electric, Mechanical and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, Dekalb ave., near Knickerbocker, Brooklyn, N. Y.





# LET IT HAUNT YOU

Every Time you Sell or Drink



from a Metal-Lined Water-Cooler.

Free your Conscience and Handle and Use only

## INDURATED FIBRE COOLERS

NO METAL!

NO CORROSION!

**CORDLEY & HAYES, Sole Agents,**

173 and 175 DUANE STREET, NEW YORK.

You can Double your Sales

—OF—

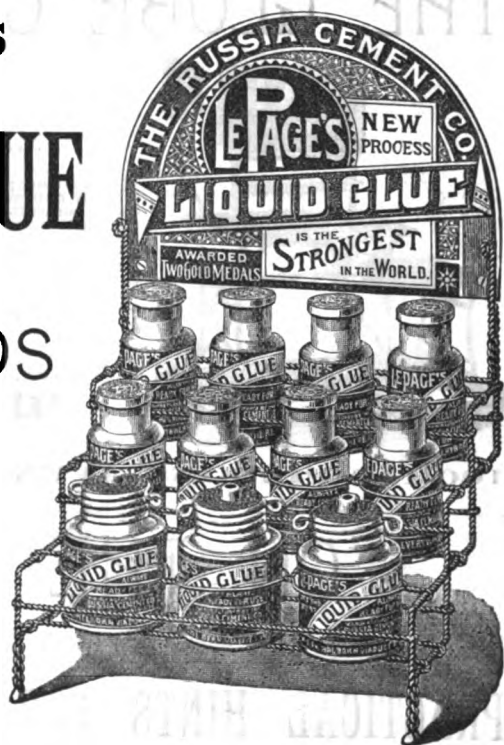
## LE PAGE'S LIQUID GLUE

By having one of these

### NEW DISPLAY STANDS

In your window or on your counter.

There is a big rush for them, so send in your orders early. Retail dealers can obtain them gratis from their wholesale dealers by ordering "a sample assortment." This case contains 2 doz. small bottles and 1 doz. patent cans, together with one of the display stands shown in accompanying cut, a quantity of chromo cards and other advertising matter. Price for the case, \$3.50, less the usual trade discount. In ordering, be sure and state that you want the Genuine Le Page's Glue manufactured by the



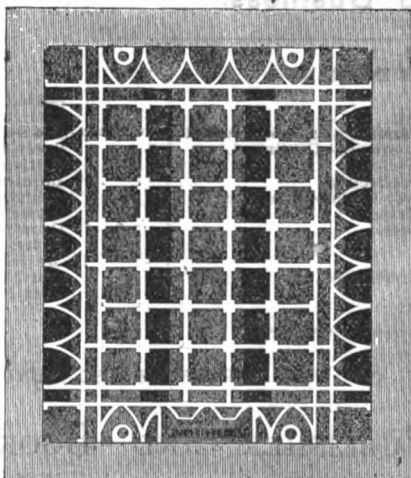
**RUSSIA CEMENT CO.,**

GLOUCESTER, MASS., U. S. A.

THE SIMONDS MANUFACTURING CO., 50 Cliff Street New York.

Furnaces, Ranges, &c.

SEND FOR CATALOGUE.



GOthic DESIGN.

6 x 8, 6 x 9, 6 x 10,  
6 x 12, 6 x 16, 6 x 18,  
7 x 10, 8 x 10, 8 x 12,

SEND FOR CATALOGUE.

Registers and Ventilators.

9 x 12, 9 x 14, 10 x 12,  
10 x 14 and 14 x 20 of  
this pattern.

## SEND FOR

Descriptive CATALOGUE  
of NEW YORK SAFETY  
DUMB WAITER Fixtures.  
Capacity 75 lbs.

The HUMPHREY PONY  
HAND ELEVATOR. Capa-  
city 500 lbs.

Sold largely by the Hardware Trade.

The Edward Storm Spring Co., Ltd.  
POUGHKEEPSIE, N. Y.

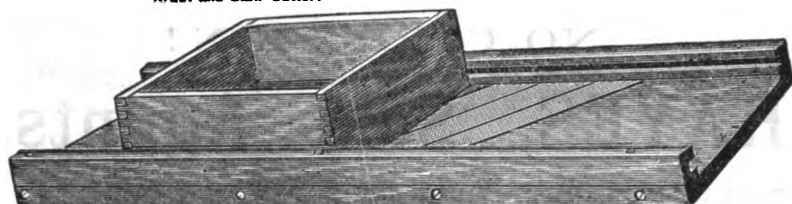
John H. Graham & Co., Gen'l Agents,  
113 Chambers St., New York.

**TUCKER & DORSEY MFG. CO., INDIANAPOLIS, U. S. A.**  
 —MANUFACTURERS OF—  
**WOODENWARE AND HARDWARE SPECIALTIES.**



Daisy Stove Truck.

Kraut and Saw Cutter.



Write for Special Discounts to Jobbers and notice next issue.

## THE GLOBE COMBINATION CABINET VAPOR STOVE.

Made Exclusively by us. A full line of sizes.



This stove possesses in combination all the recommending features of the low oven, the step and cabinet stoves, so arranged as to make it the most desirable and handsomest Vapor Stove ever constructed. It has the low step rest, and double burner for wash boiler, and an oven located entirely out of the way, which admits of a free, unobstructed use of the whole stove top. The oven is placed on just the right level to afford the user the most comfort and convenience, is large, has the burners always in sight, handsomely polished and nicked base, cast iron bottom, and, as an even roaster and baker, cannot be excelled. The door which opens to form a shelf is attached to oven body with strong cast hinges that will never break or get loose. All six burners on the stove can be used at once, and, if desirable, washing, cooking and baking can be carried on at the same time. The arrangement of this stove is such that under no condition of use does the management of the oven expose the hands to any heat from the burners below, and all risk of fire belonging to the old style back oven is positively removed.

SEND FOR SAMPLE. SECURE AN AGENCY EARLY.

Wholesale Agents: BRAND STOVE CO., Milwaukee, Wis., for Wisconsin, Minnesota and Dakota; CLARK, QUIEN & MORSE, Peoria, Ill., for Illinois; F. M. BORDEN & BRO., Philadelphia, for Pennsylvania and New Jersey; HIGHLAND FOUNDRY CO., Boston, for New England. For all other territory we ship direct from factory.

## THE STANDARD LIGHTING CO.,

100-118 PERKINS AVENUE,

CLEVELAND, OHIO.

## ON THE ROAD TO RICHES.

By WM. H. MAHER.

### PRACTICAL HINTS FOR CLERKS AND YOUNG BUSINESS MEN

On Buying and Selling Goods, Selling Goods on the Road, Business  
Correspondence, Drumming, and all Matters  
Pertaining to Business.

#### CONTENTS:

Leaving Home.  
City or Country—Which?  
The First Step.  
Taking Hold.  
The Retail Clerk.  
A Permanent Situation.  
Personal Expenses.  
Lessening Competition.  
"Telling Tales out of School."  
Anchors.  
A Step Higher.  
At the Desk.  
Cash.

Selling Goods.  
The Travelling Man.  
Leaves from a Drummer's Experience.  
A Drummer's Experience—Continued.  
"On the Road"—Selling.  
"On the Road"—Collecting.  
"On the Road"—Collecting—Continued.  
"Will you be a Partner?"  
Starting in Business.  
Buying Goods.  
Store Assistants.  
Arranging Stock, Insurance, &c.  
Advertising.

Selling Goods.  
Dunning.  
Attention to Details.  
Speculation.  
Letting Well-Enough Alone.  
Business Losses.  
"Mind your Own Business."  
Business Man's Recreation.  
Growing Rich.  
A very Successful Man.  
Mr. Damschotter's Failure.  
Our New Travelling Man.  
Tom Bailey's Wife.

SENT, POSTPAID, ON RECEIPT OF THE PRICE, \$1.50, BY

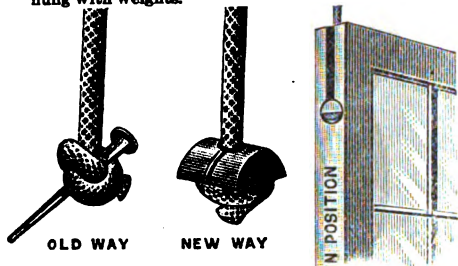
DAVID WILLIAMS, PUBLISHER AND BOOKSELLER.

66 and 68 Duane Street, New York.



—THE DETACHABLE—  
**EMPIRE SASH CORD FASTENER**  
 (Patent Applied for.)

The simplest and best method of attaching Sash Cords to Window Sashes ever invented, and a great saving in time and patience in putting in or taking out Window Sashes. Every window requires them that is hung with weights.



The sharp rib extending over the top of the fastener through the centre, is by the weight of the sash caused to sink into the frame and thus hold from moving. The most useful invention for Window Sash ever put on the market. Every window requires them.

Reasons why you should use them: It costs less than one and one-half cents per Sash; requires no nails or screws; can be put in or taken out in less than one minute; prevents the knot from fraying out and getting between the sash and frame; does not split the sash like nails or screws; prevents the cord from running back into the weight pocket. Manufactured by the **EMPIRE PORTABLE FORGE CO.** Cohoes, N.Y. U. S. A. Depot for N.Y. City Delivery, C. F. Guyon & Co., 99 Reade St

**Abbe's Patent**  
**SASH CORD FASTENER.**

Patented Feb. 12, 1889.

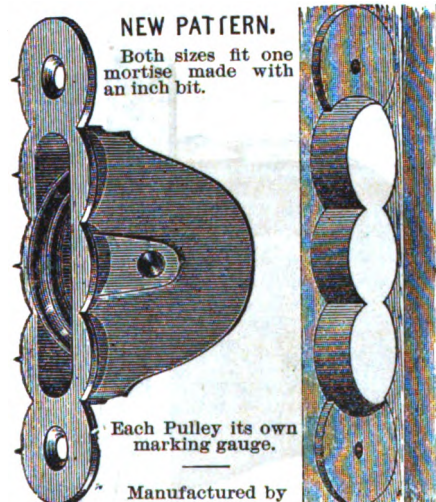
An entirely new device for fastening braided and all hard laid cords to the sash and weights, without tying knots. Can be applied in less time than is required to unbraid and tie a knot, besides saving 1½ feet of cord. Manufactured in two sizes: No. 1 takes Nos. 7 and 8 cord and No. 2 takes Nos. 9 and 10 cord. Send for prices and circulars to the manufacturer.



**EDWIN W. ABBE,**  
 New Britain, Conn.

**JOHN H. GRAHAM & CO.,** 113 Chambers St., New York  
 GENERAL AGENTS.

**Palmer's Common Sense Frame Pulley.**



Each Pulley its own marking gauge.  
 Manufactured by  
**PALMER HARDWARE MFG. CO.,** Troy, N. Y.  
 Sole Eastern Agts., Peabody & Parks, Troy, N. Y.

**COMMON MOUSE TRAPS**  
**BEST FOR USE!**  
**Ripley Mfg. Co.,** Unionville, Conn.

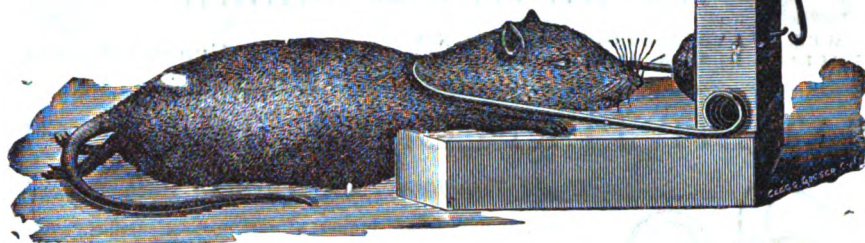


Porcelain-Lined Lemon Squeezers, Steak Hammers, Boot Jacks, Magnetic Tack Hammers, Mallets, Bung-Starts, Hand Screws, Beacon Hill Pat. Mouse Traps, Sunny-Side 2lb. Lap-Board

**The F. F. ADAMS CO.,**  
**ERIE, PA.,**  
 MANUFACTURERS OF

**Rat and Mouse Traps,**

Step and Extension Ladders,  
 Clothes Bars, Clothes Wringers, etc.  
 SEND FOR CATALOGUE.



**HOMOG- ENEOUS**  
 TRADE MARK  
**"NEVER BREAK"**  
**STEEL SPIDER**



**THE BRONSON SUPPLY CO.**  
**CLEVELAND, O., U. S. A.**

**EXCLUSIVE MANUFACTURERS**  
 Nos. 7, 8, 9, 10 and 12.

Will not absorb Grease; will not impart the Flavor of previously Cooked Food; Easily kept clean.  
**BETTER THAN ENAMEL**  
**BECAUSE THEY WILL NOT SCALE.**



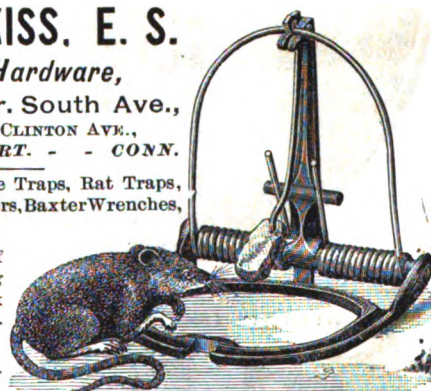
**HOTCHKISS, E. S.**

Mfr. Hardware,  
 Water, cor. South Ave.,  
 WORKS: CLINTON AVE.,  
 BRIDGEPORT - - CONN.

Patent Mouse Traps, Rat Traps,  
 Lemon Squeezers, Baxter Wrenches,  
 &c., &c.

All classes of  
 manufacturing  
 and tool work  
 taken on contract.

Correspondence solicited.



**The Champion Safety Window Sash Lock**  
**IS KING OF THEM ALL!**

It combines all the qualities desirable in a sash lock, having the merit of extreme simplicity and remarkable strength, combined with the greatest efficiency of any lock now known. Architects, Builders and Hardware Dealers are receiving them with universal and enthusiastic approval.

For price-list and discounts apply to  
**The Champion Safety Lock Co.,**  
 21 & 23 Champlain St., - - Cleveland, O.



**Standard Coat & Hat Hook.**

**HANBLIN & RUSSELL MFG. CO.,** Worcester, Mass.  
 HARDWARE SPECIALTIES AND STANDARD WIRE GOODS.

**U. S. PATENTS.**  
 Oct., 1876.  
 Oct., 1884.  
 Nov., 1887.  
 Dec., 1887.  
 England, France and Germany.

**Direct Brace.**

**GUARANTEED**  
 to be the Strong-  
 est Hook on the  
 Market.



# KEYSTONE LOCK WORKS,

LANCASTER, PA.

All patents  
sustained  
by  
U. S. Courts.



E. T. FRAIM,

Manufacturer of the Celebrated Patent Inter-Locking Tumbler

## JAIL PADLOCKS

The only durable low-priced Scandinavian padlock ever produced. 34 different grades and sizes, all malleable iron. Red, black and bright brown, Japanned.

FLAT STEEL KEY LOCKS A SPECIALTY.

Write for New Illustrated Catalogue and Discounts.

TOWER & LYON, 95 Chambers Street, N. Y.

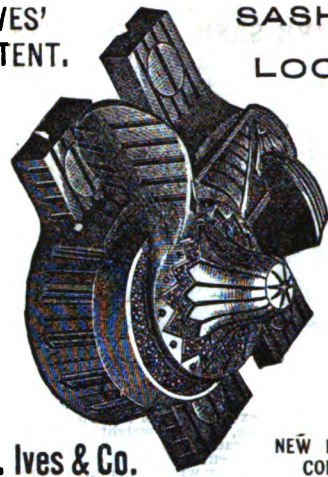
SURPLESS, DUNN & ALDER, 97 Chambers Street, N. Y. } General Agents.



IVES' PATENT.

SASH LOCK.

MANUFACTURED ONLY BY



BULL TIP, ORNAMENTAL.

H. B. Ives & Co.

NEW HAVEN  
CONN.

## PATENT PERFECTION PADLOCK

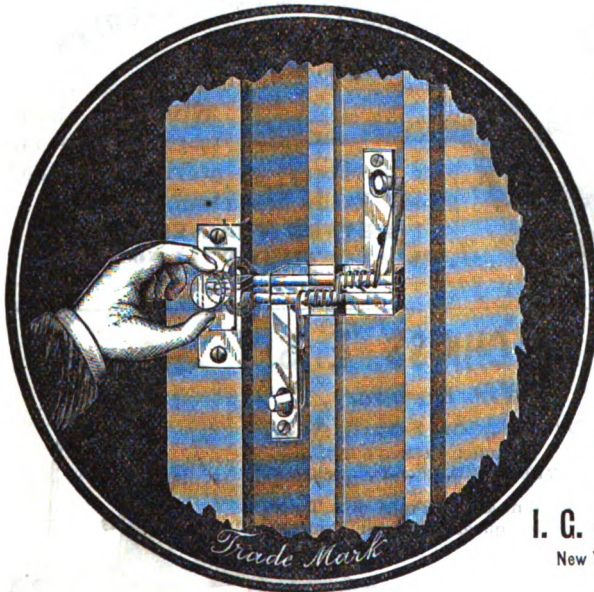


Eight Tumblers. Key Turning Both Ways.

Sizes,  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. Same with chain attached as a key holder, the best ever invented.

AMES SWORD CO., Chicopee, Mass.

Send for Price Lists and Circulars.



## THE Timby Burglar-Proof SASH-LOCK —AND— VENTILATOR.

One Lock only required for a Window. It locks either or both sash securely in any position desired, thereby affording the means of Perfect Ventilation; also absolute security against Burglars and Sneak-Thieves.

Its simplicity, automatic action, strength, ventilating qualities and adaptability to varying thicknesses of sash or inside stops render it more desirable than any other Sash-Lock now offered in the market.

Manufactured from the best Malleable Iron, Steel, Brass and Bronze Metal.

I. G. JENKINS, Manufacturer, Oswego, - N. Y.

New York City Office, 102 Chambers St.

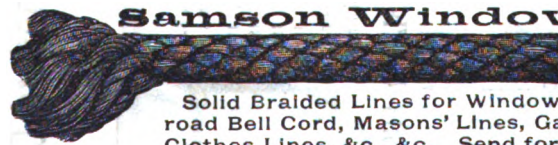
T. F. TIMBY, Manager.

## HUGUNIN 1888 IMPROVED PAT. SCREW SASH BALANCES.



An adjustable Mechanism with positive power for movably balancing Sash. Easily applied or repaired and inexpensive. Costing, applied, less than additional cost of boxed, over plain frame. No attachment to the sash or clock springs to rust out set, and throw away, or sash ribbons to kink and break, allowing ready removal for cleaning, &c. Two widths: Small,  $\frac{1}{4}$ ; Medium,  $\frac{1}{2}$ , for sash, each under 12 and 20 lbs. The 1888 improved are warranted to give permanent satisfaction. Sample Sets by mail, prepaid, 80c. and \$1.00 each, according to size, adapted to buildings, vessels, cars, libraries and for all vertically sliding sash, doors or panels, under 20 lbs. each; little space in frame required for their use. If not kept by your dealer, order direct from ROBT B. HUGUNIN WINDOW FIXTURE MFG. CO., Hartford, Ct.

## Samson Window Cord.

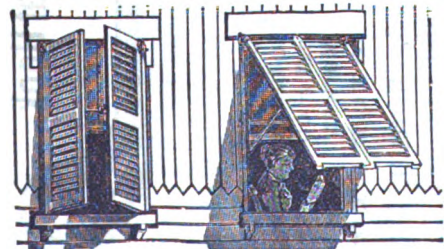


Solid Braided Lines for Window Cord, Railroad Bell Cord, Masons' Lines, Garden Lines, Clothes Lines, &c., &c. Send for Samples.

SAMSON CORDAGE WORKS 164 High St., Boston, Mass.



## NORTH'S PATENT AUTOMATIC Blind Awning Fixtures



for old or new blinds. Instantly changed from blind to awning or from awning to blind. Thousands in use. The best blind fixture in the world. Prices reduced. These goods are now made and controlled by

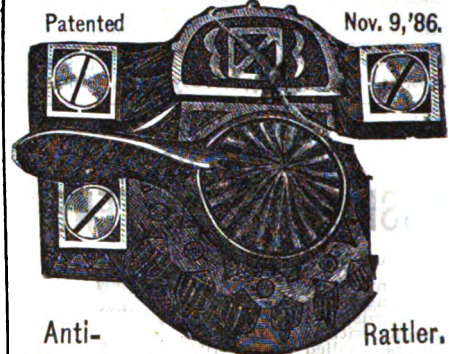
THE WIRE GOODS COMPANY,

Worcester, Mass.

## Security Sash Lock

Patented

Nov. 9, '86.

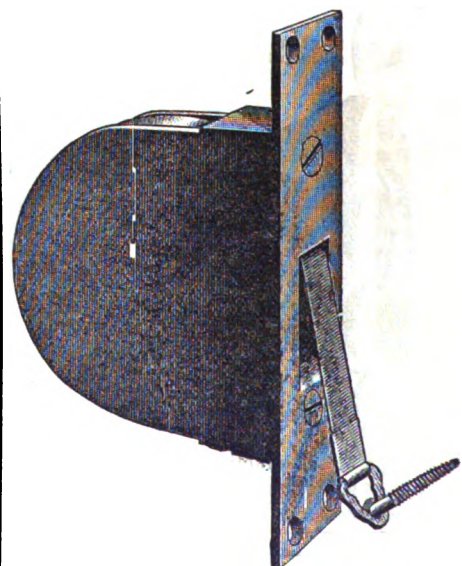
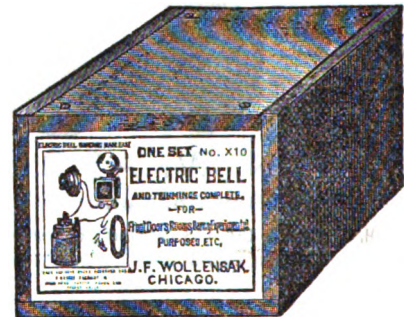


Anti-

Rattler.

The Claffen Mfg. Co.,

Cleveland, Ohio, U. S. A., Sole Manufacturers.



## The Caldwell Sash Balance

is compact, simple and durable. It is easily applied and is superior to all other methods for balancing Window Sash. Adapted to old or new windows, does not require box frames, and does not get out of order. The Caldwell Balance for Mullion Windows is the best yet invented.

N. B.—In ordering a sample set give exact weight and height of each sash. Send for catalogue to

W. H. CALDWELL,

285-290 State Street,

Rochester, N. Y.



NO EQUAL



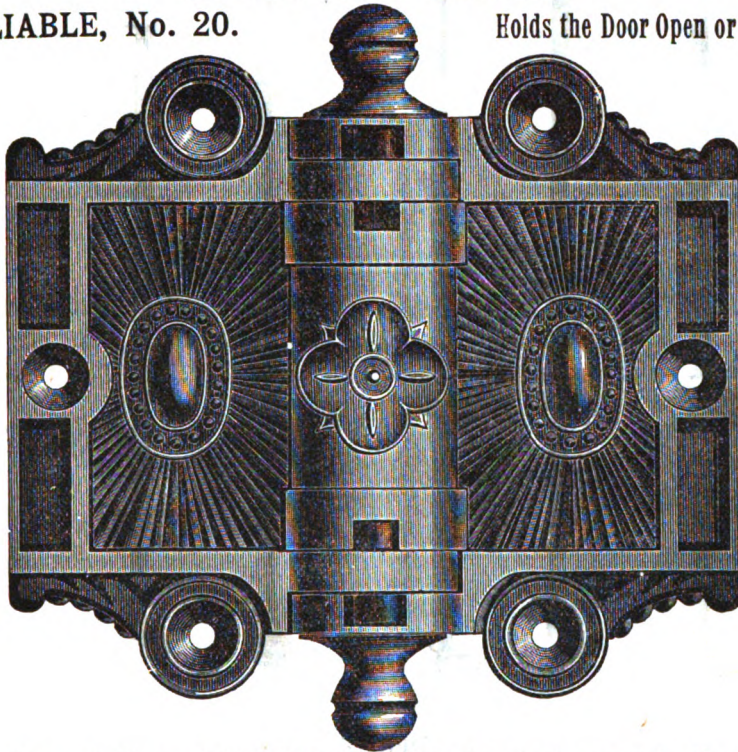
**LEWIS' PATENT STRAP AND T HINGES**  
—MANUFACTURED BY—  
**E. B. LANMAN,**  
Columbus, Ohio.  
Discounts mailed on application

ON POST ON DOOR.

FOR STRENGTH.

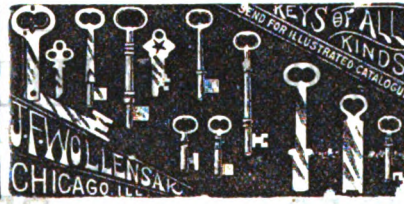
**The HENRY C. HART MANUFACTURING CO.**  
Manufacturers of Railway, Cabinet and Special Hardware,  
**DETROIT MICH.**  
**RELIABLE, No. 20.** Holds the Door Open or Closed.

For Sale by all Jobbers.



Send for Catalogue.

21 Styles and Sizes of **SPRING HINGES**, the most complete line in the world. Our "**HOLD BACK**" **SPRING HINGES** (that hold the Door either open or shut) are the best selling, best looking and best working.



### TRADE "SECRETS" AND PRIVATE RECIPES

A Collection of Recipes, Processes and Formulae that have been offered for sale at prices varying from 25 cents to \$500. With notes corrections, additions and special hints for improvements. Edited by JOHN PHIN. Cloth Gilt Title, 60c.

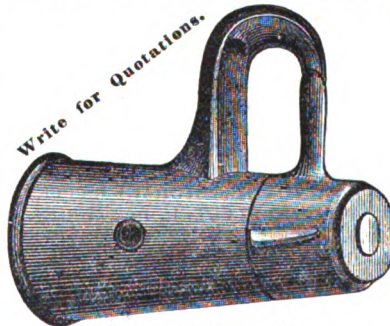
This work was prepared by the author for the purpose of presenting in a compact form all those recipes and "trade secrets" which have been so extensively offered for sale.

Sent, postpaid, on receipt of price, by

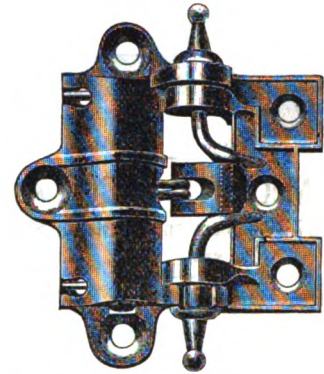
**DAVID WILLIAMS, Bookseller and Publisher,**  
66 and 68 Duane St. New York.

### PREMIUM SPRING WHIFFLETREE HOOKS.

Write for Quotations.



MANUFACTURED BY  
**HEADS IRON FOUNDRY**  
UTICA, N. Y.

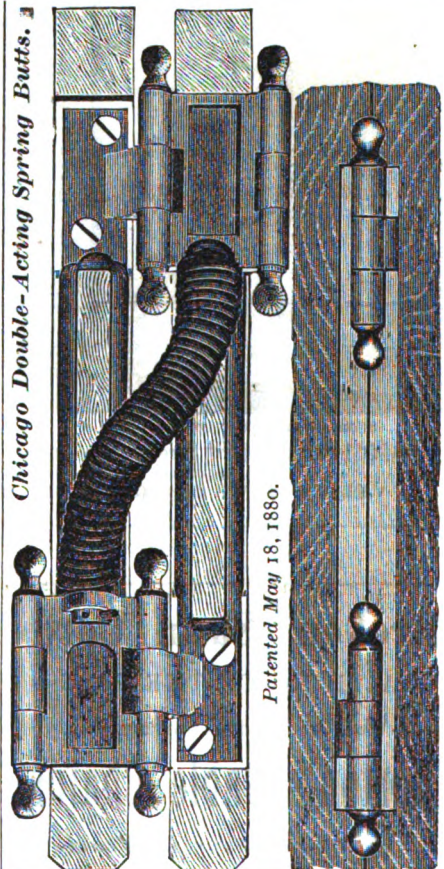


### NEW IDEA SPRING HINGE

holds the door strongest when closed, resistance gradually decreases in opening, and increases in closing the door. A covered (patented) hold-back Spring Hinge. Full particulars. Free Sample and Prices by mentioning this paper,

**STOVER MAN'F'G CO.,**  
Freeport, Ill.

Chicago Double-Acting Spring Butts.

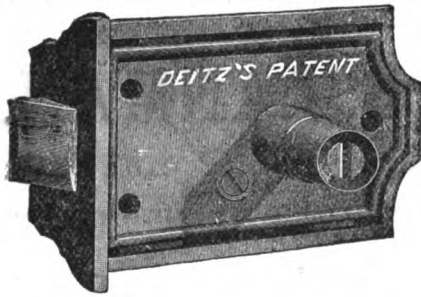


Patented May 18, 1880.

DOORS.	1 Jap'ed Pair.	1½ Jap'ed Nkl S'g Pair.	21 Nickel Plated Pair.	31 Bronze Plated Pair.	41 Real Bronze Pair.
¾ to 1 in....	\$1.20	\$1.30	\$3.00	\$3.00	\$8.50
1¼ to 1½ in....	1.50	1.70	3.75	3.75	9.50
1¾ to 2 in....	2.50	3.00	5.50	5.50	12.00
2¼ to 2½ in....	4.00	4.75	7.50	7.50	20.00
2¾ to 3 in....	7.00	7.75	10.00	10.00	30.00
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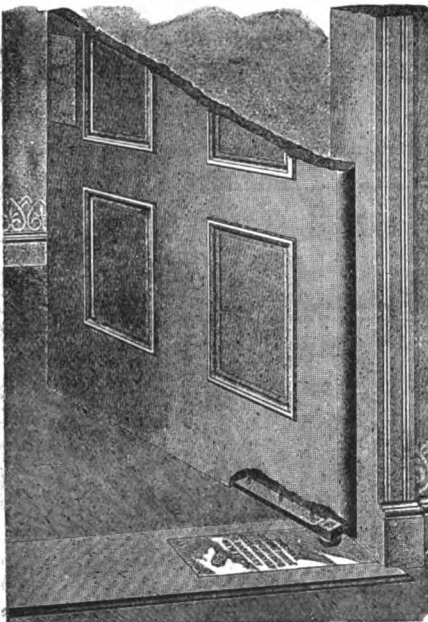


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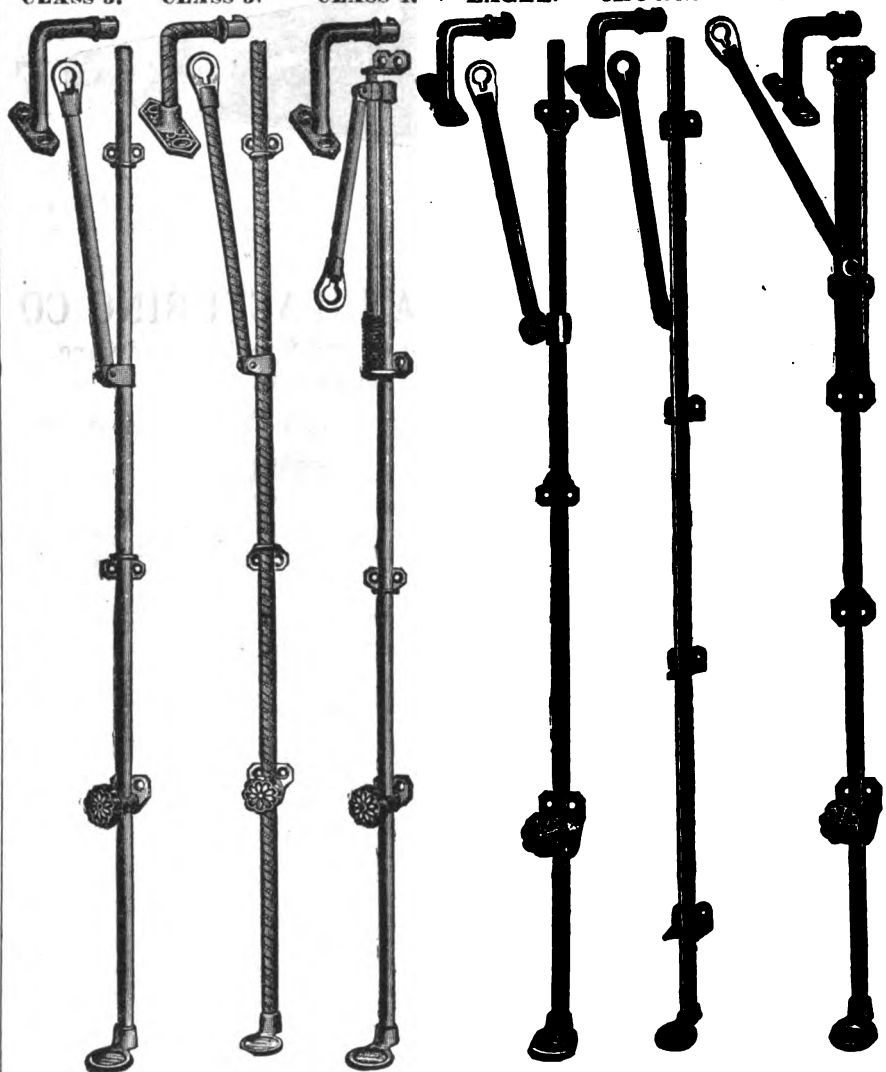
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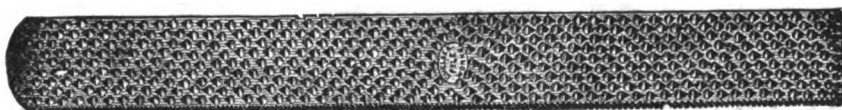

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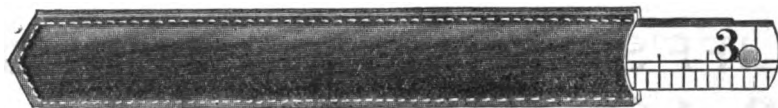


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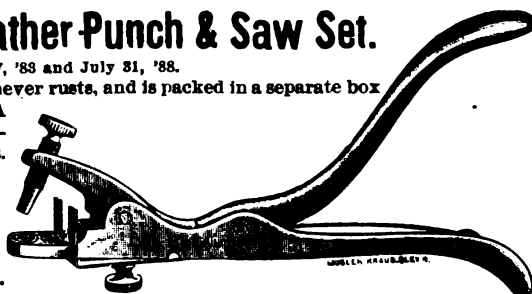
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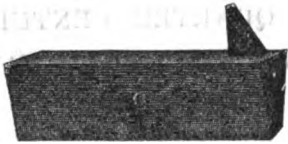
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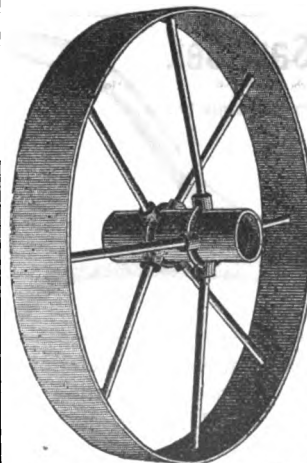
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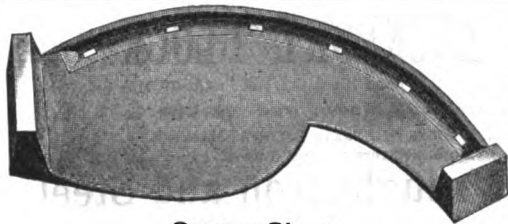
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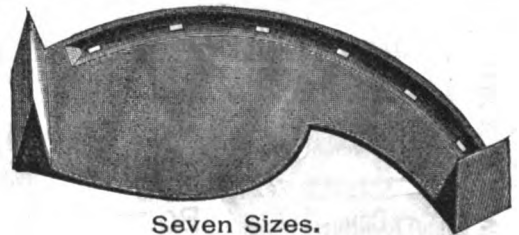
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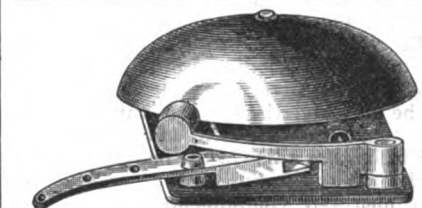
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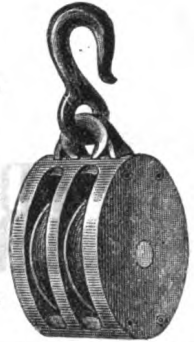
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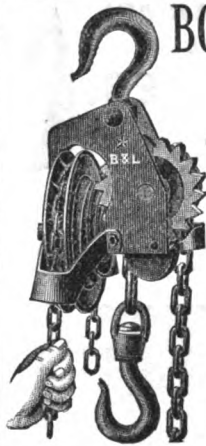
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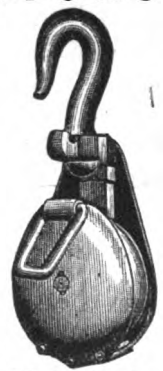
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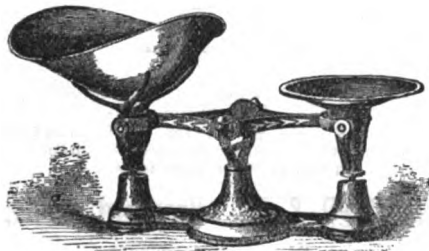
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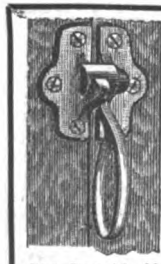
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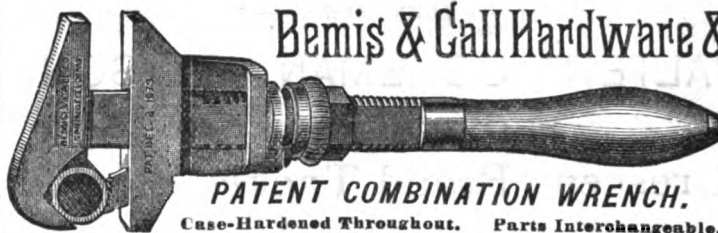
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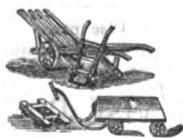
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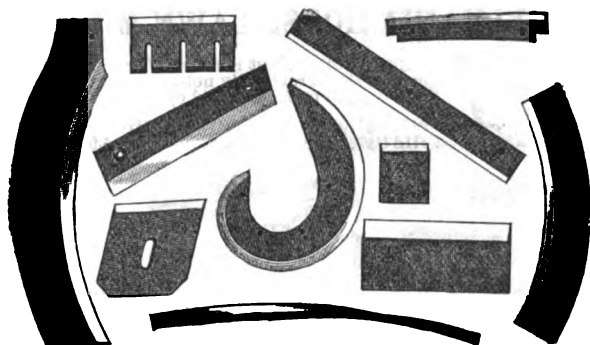
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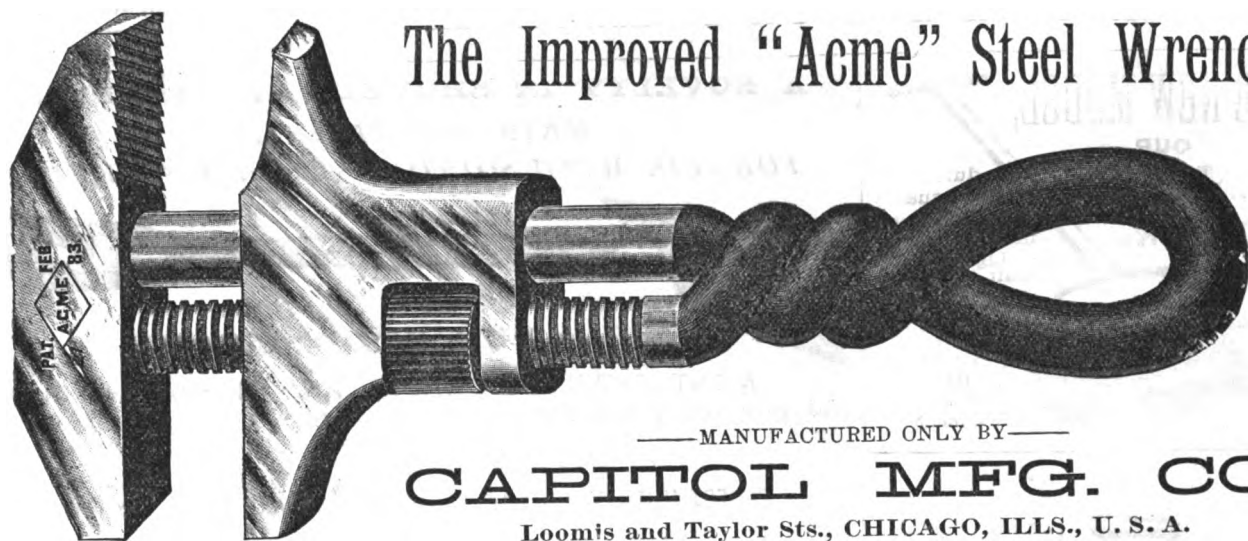
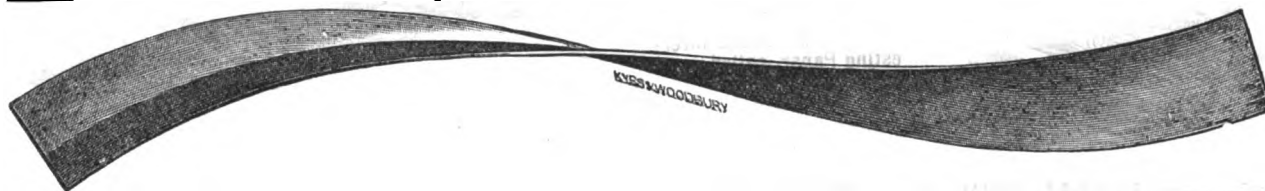
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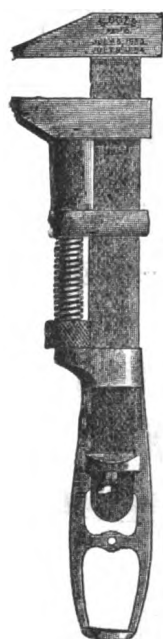
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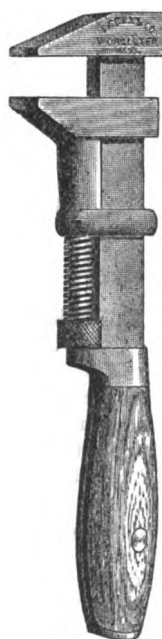
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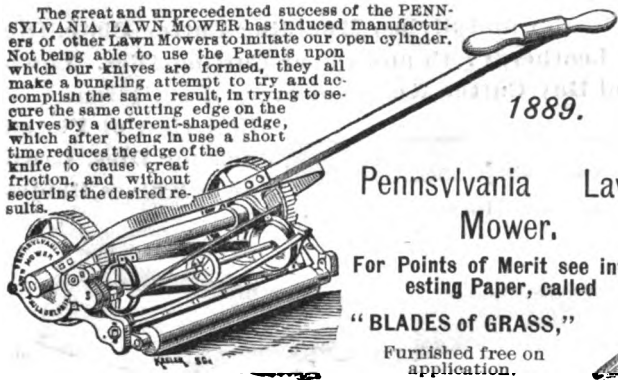
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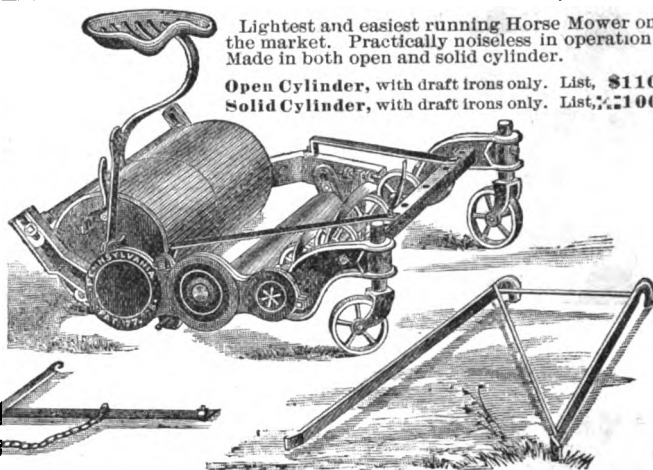


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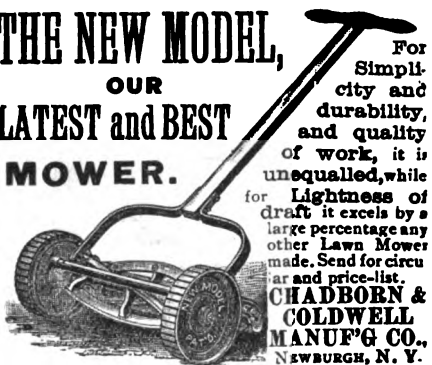
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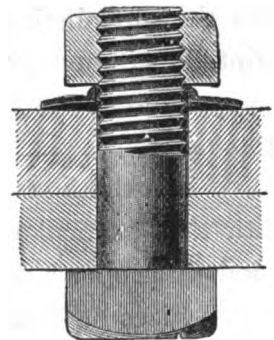
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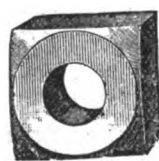
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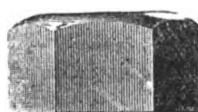
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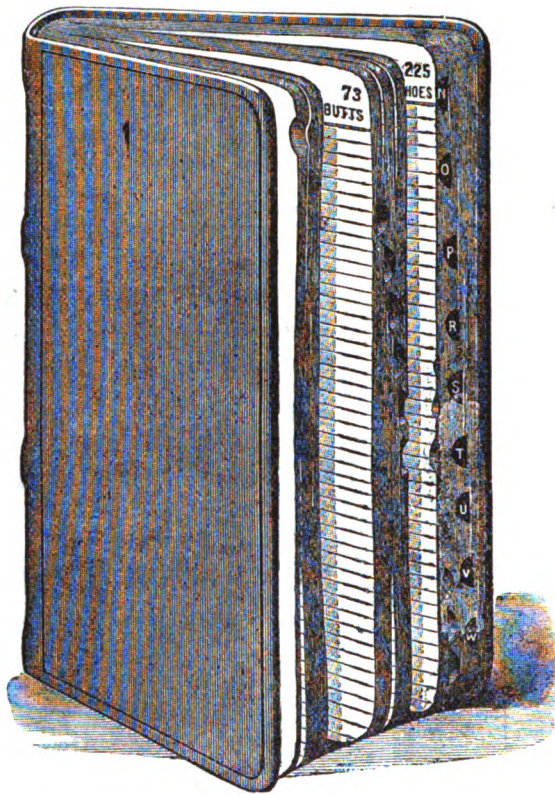
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## Engineers and Manufacturers.

Wainwright, C. D., Co., Boston, Mass.

## Engines, Gas.

Schleicher, Schumm & Co., Phila., Pa.

## Engines, Steam, Makers of.

Ball Engine Co., Erie, Pa.  
Buckeye Engine Co., Salem, Ohio.  
Cleveland & Hardwick, Erie, Pa.  
Gordon, Strobel & Laureau, Phila., Pa.  
Harrisburg Car Mfg. Co., Harrisburg, Pa.

Leffer, Jas. & Co., Springfield, O.  
Norwalk Iron Works Co., S. Norwalk.  
Russell & Co., Massillon, O.

Shipman Engine Co., Boston, Mass.  
Tod, William & Co., Youngstown, O.  
Westinghouse Mch. Co., Pittsburgh, Pa.  
Wetherill, Robt. & Co., Chester, Pa.

## Engines, Water.

Bennam Hydraulic Motor Co., dence, R. I.

## Expansion Bolts.

Boone, W. C. & Son, Brooklyn.

## Faucets, Self-Measuring.

Enterprise Mfg. Co., Phila., Pa.  
Lane Bros., Poughkeepsie, N. Y.

## Faucets, Wooden, Makers of.

**Fire Brick, Makers of.**

Borgner & O'Brien, Philadelphia, Pa.  
Gardner, James, Cumberland, Md.  
Kreischer B. & Sons, foot E. Houston,  
N. Y.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander, James & Son, Troy, N. Y.  
Raritan Hollow & Porous Brick Co.,  
115 Broadway, N. Y.  
Union Mining Co., Philadelphia, Pa.  
Valentine, M. D. & Bro., Woodbridge.

**Fishing Tackle.**

Dame, Stoddard & Kendall, Boston,  
Mass.  
Horton Mfg. Co., Bristol, Conn.

**Flint Paper.**

York Flint Paper Co., York, Pa.

**Forges, Portable, &c.**

Brown & Patterson, Brooklyn, N. Y.  
Bullock, T. H., Cleveland, O.  
Buffalo Forge Co., Buffalo, N. Y.  
Sturtevant, B. F., Boston, Mass.

**Forgings, Iron and Steel.**

Cambridge Steel—Cambridge Iron Co.,  
Johnstown, Pa.  
Hicks & Dickey, Philadelphia, Pa.  
Miller Forge Co., Pittsburgh, Pa.  
Scranton Forging Co., Scranton, Pa.

**Foundry Facings.**

Paxson, J. W. & Co., Phila.  
S. Obermayer Foundry Supply Mfg.  
Co., Cincinnati, O.

**Foundry Riddles.**

Estey, W. S., 71 Fulton, N. Y.  
Phoenix Wire Works, Detroit, Mich.

**Foundry Supplies.**

Detroit Foundry Equipment Co., De-  
troit, Mich.  
S. Obermayer, Foundry Supply Mfg.  
Co., Cincinnati, O.  
Paxson, J. W. & Co., Philadelphia.

**Friction Clutches.**

Hill Clutch Works, Cleveland, O.  
Moore & White Co., Philadelphia, Pa.

**Fuel.**

Aerated Fuel Co., Springfield, Mass.

**Furnaces, Foundry.**

Byram & Co., Detroit, Mich.

**Furnace Hoists.**

Stokes & Parrish Machine Co., Phila.

**Gas & Steam Fitters' Supplies.**

Pancoast & Maule, Phila., Pa.

**Gear Cutters.**

D. E. Whitton Mach. Co., New London,  
Conn.

**Glass Boards.**

Canton Saw Co., Canton, Ohio.  
Lufkin Rule Co., Cleveland, O.

**Glass Cutters.**

Monce, S. G., Bristol, Conn.

**Glue.**

Russia Cement Co., Gloucester, Mass.

**Grinding and Polishing Mch.**

Diamond Mach. Co., Providence, R. I.

**Grindstone Dressing Machinery.**

Blake & Johnson, Waterbury, Conn.

**Grindstones.**

Cleveland Stone Co., Cleveland, O.  
Lake Huron Stone Co., Detroit and  
Chicago.

**Gunpowder, Makers of.**

Lafin & Rand Powder Co., N. Y.

**Hammock Chairs.**

Alford & Berkele Co., 77 Chambers,  
N. Y.

**Hardware Comm'n Merchants.**

Doscher, Martin, 88 Chambers, N. Y.  
Field, Alfred & Co., 93 Chambers, N. Y.  
Jacobus, W. H. & Co., 90 Chambers, N. Y.  
Moore Mfg. & Fdry Co., Milwaukee, Wis.

**Hardware Manufacturers.**

Hart, Henry C. Mfg. Co., Detroit, Mich.  
Shepard Hdw. Co., Buffalo, N. Y.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford,  
Conn.

**Hardware Mfrs. Agents.**

Dana, R. H. & Co., 25 Beaver, N. Y.  
Farrar, B. G. & Co., St. Louis, Mo.  
Graham, John H., 115 Chambers, N. Y.  
Suppess, Dunn & Alder, 97 Chambers,  
N. Y.  
Tommins & Adams, 116 Chambers, N. Y.

**Hardware, Marine.**

Wilcox, Crittendon & Co., Middletown,  
Conn.

**Hardware Specialties.**

Acme Shear Co., Bridgeport, Conn.  
Am. Bit, Brace Co., Buffalo, N. Y.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Greene, Tweed & Co., N. Y.  
Paine, Diehl & Co., Philadelphia, Pa.  
Rex, A. C. & Co., Philadelphia, Pa.  
Wire Goods Co., Worcester, Mass.  
Underhill, Clinch & Co., N. Y.

**Harness Snaps.**

Covert Mfg. Co., West Troy, N. Y.

**Hay Fork Pulleys.**

Boston and Lockport Block Co., Bos-  
ton, Mass.

**Hay Knives.**

Hiram Holt & Co., East Wilton, Me.  
Nolin, G. & M., Skowhegan, Me.

**Hinges.**

Union Mfg. Co., 103 Chamber

**Hoisting Machines.**

Box, Alfred & Co., 314 Green, Phila.  
Energy Mfg. Co., Philadelphia, Pa.  
Harrington, E. Son & Co., Phila.  
Lidgerwood Mfg. Co., 96 Liberty, N. Y.  
Maris Machine Co., Philadelphia.  
Moore Mfg. & Fdry Co., Milwaukee, Wis.  
Moore, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.

**Hollow-Ware.**

Bronson Supply Co., Cleveland, Ohio.

**Horse Nails, Makers of.**

National Horse Nail Co., Vergennes.

**Horse Shoes, Makers of.**

Phoenix Horse Shoe Co., Poughkeeps-  
ie, N. Y.  
Rhode Island Horse Shoe Co., Provi-  
dence.  
The Burden Iron Co., Troy, N. Y.

**Hot-Blast Stoves.**

Witherow, James P., Pittsburgh, Pa.

**Hydrants, &c.**

McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Jacks.**

Dudgeon, Richard, 24 Columbia, N. Y.  
McCoy & Sanders, 26 Warren, N. Y.  
Watson & Stillman, 204 E. 43d, N. Y.

**Ice-Cream Freezers.**

Am. Machine Co., Philadelphia, Pa.  
Shepard Hdw. Co., Buffalo, N. Y.

**Ice Crushing Machines.**

G. Irving Abendroth, 28 Cliff, N. Y.

**Indurated Fibre Ware.**

Cordley & Hayes, 37 Barclay, N. Y.

**Insurance, Boiler.**

Hartford Steam Boiler Inspection &  
Insurance Co.

**Iron, Manufacturers' Agents.**

Cox, Justice, Jr., & Co., Philadelphia.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
White & McLure, Pittsburgh, Pa.

**Iron, Manufacturers of.**

Aetna Iron & Steel Co., Bridgeport, O.  
Alan Wood Co., Philadelphia.  
Burden Iron Co., Troy, N. Y.  
Long & Co., Pittsburgh, Pa.  
Mahoning Valley Iron Co., Youngs-  
town, Ohio.  
Montour Iron & Steel Co., Danville,  
Pa.  
Moorehead-McCleane Co., Pittsburgh.  
Passaic Rolling Mill Co., Paterson.  
Phoenix Iron Co., 410 Walnut, Phila.  
Pottstown Iron Co., Pottstown, Pa.  
Sternbergh, J. H. & Son, Reading, Pa.  
Stuart & McLean, Pittsburgh, Pa.  
Troy Steel & Iron Co., Troy, N. Y.  
Whitney, A. R. & Co., 58 Hudson, N. Y.  
Willmot & Hobbs Mfg. Co., Bridgeport.

**Iron and Steel, Swedish.**

Lewander & Co., Boston, Mass.  
Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.  
Page, Newell & Co., Boston, Mass.  
Philp, C. v., 18 & 20 Liberty, N. Y.

**Iron Brokers.**

Etting, Edward J., Philadelphia, Pa.  
Walbaum, W. H. & Co., Philadelphia.

**Iron Commission Merchants.**

Anthony & McElroy, Philadelphia, Pa.  
Hart, Wm. R. Co., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Lea, J. Tatnall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Wister, L. & R. & Co., Philadelphia.

**Iron Ore.**

Pullman, J. Wesley, Phila., Pa.  
Smith, Edmund D. & Co., Philadelphia, Pa.  
Walbaum, W. H. & Co., Philadelphia.

**Iron Dealers.**

Abbott, Jere & Co., N. Y. and Boston.  
Blakely & McLellan, Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Busseusius & Cuniff, Philadelphia.  
Cooney, Daniel F., N. Y.  
Cox, Justice, Jr., & Co., Philadelphia.  
Esherick, Cotton & Co., Philadelphia.  
Gill, Thompson C. & Co., Phila., Pa.  
Hart, Wm. R. & Co., Philadelphia.  
Hicks & Dickey, Philadelphia, Pa.  
Himrod, Chas. & Co., Chicago, Ill.  
Hoffman, J. W. & Co., Philadelphia.  
Judson, B. F., 457 & 459 Water, N. Y.  
Keeley, Jerome & Co., Philadelphia.  
Lindsay, Jas. G. & Co., Philadelphia.  
Lundberg, Gustaf, 38 Kilby, Boston.  
Moffat, Frank D., 100 Beekman, N. Y.  
Naylor & Co., 90 John, N. Y.  
Ogden & Wallace, N. Y.  
Pettis & Higgins, Providence, R. I.  
Phillips, F. R., Philadelphia, Pa.  
Pierson & Co., 24 to 27 West, N. Y.  
Richards, D. W. & Co., N. Y.  
Stiles, Wheeler & Co., Philadelphia.  
Wallace, Wm. H. & Co., Albany &  
Washington streets, N. Y.  
White & McLure, Pittsburgh, Pa.  
Wilson, E. H. & Co., Philadelphia.  
Whitney, A. R. & Co., N. Y.

**Iron, Pig, Importers of.**

Abbott, Jere & Co. (Swedish), New  
York and Boston.  
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet, Manufacturers of.**

Aetna Iron & Steel Co., Bridgeport, O.  
Standard Iron Co., Bridgeport, Ohio.  
W. Dewees Wood Co., Lim., Pittsburgh.

**Iron, Steel and Nails.**

Boyle, T. G. & Co., Pittsburgh, Pa.  
Morris, Wheeler & Co., 28 Reade, N. Y.

**Ironwork, Ornamental.**

Barnum, E. T., Detroit, Mich.  
Champion Iron Fence Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
Mast, Foss & Co., Springfield, O.

**Jacks.**

McCoy & Sanders, 26 Warren, N. Y.

**Kettles, Brass and Copper.**

Geiger & Bush, Bucyrus, Ohio.

**Keys.**

Wollensak, J. F., Chicago, Ill.

**Lathes.**

Millers Falls Co., 93 Reade, N. Y.  
Prybly, P., 467 W. 40th, N. Y.  
Sebastian, May & Co., Cincinnati, O.

**Lawn Mowers.**

Chadborn & Coldwell Mfg. Co., New-  
burg, N. Y.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Lloyd & Supplee Hdw. Co., Phila., Pa.  
Mast, Foss & Co., Cincinnati, Ohio.

**Lemon Squeezers.**

Hotchkiss, E. S., Bridgeport, Conn.  
Ripley Mfg. Co., Unionville, Conn.

**Levels.**

Richardson, C. F., Athol, Mass.

**Locks & Knobs, Manufacturers of.**

Deitz, A. E., 97 Chambers, N. Y.  
Smith & Egge Mfg. Co., Bridgeport.  
Yale & Towne Mfg. Co., Stamford.

**Machine Knives.**

Loring Coe & Co., Worcester, Mass.

**Machinery.**

Adt, John & Son, New Haven, Conn.  
Am. Tool Co., Cleveland, Ohio.  
Barnes, W. F. & John, Rockford, Ill.  
Birmingham Iron Foundry, Birming-  
ham, Conn.  
Bigelow, C. E., 45 Dey, N. Y.  
Briggs, Marvin, 12 Broadway, N. Y.  
Bullard, E. F., 62 College Place, N. Y.  
Carlinson, Thos., Allegheny, Pa.  
Chandler & Farquhar, Boston, Mass.  
Curtis & Curtis, Bridgeport, Conn.  
Cruikshank, D. B., Providence, R. I.  
Deering, Wm. & Co., Chicago, Ill.  
Fall River Iron Works Co., Fall River,  
Mass.  
Gavin, E. E. & Co., 139 Centre, N. Y.  
Gray's Ferry F'dy & Boiler Co., Phila.,  
Pa.  
Gray, R. J. & Co., 131st & 4th Ave., N. Y.  
Harrington, E. Son & Co., Phila., Pa.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Johnson, Israel H., Jr., & Co., Phila.  
Lodge, Davis & Co., Cincinnati, O.  
Lovegrove & Co., Philadelphia, Pa.  
Makinon, J. A. Mch. Co., 22 Warren,  
N. Y.  
Moore Mfg. & Fdry Co., Milwaukee, Wis.  
Newark Machine Tool Works, New-  
ark, N. J.  
New York Mach'y Depot, N. Y.  
Pedrick & Ayer, Philadelphia, Pa.  
Prybly, P., 467 W. 40th, N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.  
Prentiss Tool & Supply Co., N. Y.  
Robertson, W. H., Chicago, Ill.  
Sebastian, May & Co., Cincinnati, O.  
Sellers, Wm. & Co., Phila.  
Seyfert, L. F., Philadelphia, Pa.  
Snell, Henry L., Philadelphia, Pa.  
Stiles & Parker Press Co., Middletown,  
Conn.  
Stokes & Parrish Machine Co., Phila.  
Stow Flexible Shaft Co., Ltd., Phila.  
Waterbury Foundry and Mch.  
Co., Waterbury, Conn.  
West, Thos. D. Fdy Co., Cleveland, O.  
Wetherill, Robert & Co., Chester, Pa.  
Wheat, Thos. & Co., Philadelphia, Pa.

**Machinists' Scales.**

Coffin & Leighton, Syracuse, N. Y.

**Machinists' Tools and Supplies.**

Blaisdell, P. & Co., Worcester, Mass.  
Bowman, Albert H., St. Louis, Mo.  
King, J. J. & Co., Waterbury, N. Y.  
Palmer, Cunningham & Co., Phila.  
Sellers, Wm. & Co., Phila.

**Mallets.**

Boston & Lockport Block Co., Boston,  
Mass., and Lockport, N. Y.  
Brooklyn Mallet & Handle Co., Brook-  
lyn, N. Y.  
N. Y. Mallet & Handle Works, N. Y.

**Mantels.**

Ehman & Simon Mfg. Co., Chicago, Ill.

**Meat Choppers.**

Enterprise Mfg. Co., Philadelphia, Pa.

**Metals.**

Fearing, Wm. S., 100 Chambers, N. Y.  
Hendricks Bros., 49 Cliff, N. Y.  
Naylor & Co., 99 John, N. Y.  
Pheips, Dodge & Co., Cliff St., N. Y.

**Metal Brokers.**

American Metal Co., N. Y.

**Metallurgists.**

Britton, J. Blodgett, Phila.

**Mine Lamps.**

Darby, Edw. & Sons, Phila., Pa.  
Hunt & Connel, Scranton, Pa.  
Leonard, B. E., Scranton, Pa.  
Leonard, T. F., Scranton, Pa.

**Mining Screens.**

Harrington & King Perforating Co.,  
Chicago, Ill.

**Molding Sand.**

Paxson, J. W. & Co., Phila.

**Nail Machinery.**

Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nails.**

Bellier Nail Works, Bellaire, O.  
Borden & Lovell, 70 West, N. Y.  
E. & G. Brooke Iron Co., Birdsboro.  
Cumberland Nail & Iron Co., Phila.  
Fuller Bros. & Co., 139 Greenwich, N. Y.  
Hicks & Dickey, Philadelphia, Pa.  
Himrod, Chas. & Co., Chicago, Ill.  
Pottstown Iron Co., Pottstown, Pa.  
Stebbins, C. J., 103 Reade, N. Y.

**Nails, Cut.**

Borden & Lovell, 70 West, N. Y.

**Nickel Platers' Supplies.**

Eddy Electric Mfg. Co., Windsor,  
Conn.  
Zucker & Levett Chemical Co., 587 to  
564 West 16th, N. Y.

**Norway Shapes, Rollers of.**

Naylor & Co., 99 John, N. Y.  
Rowland, William & Harvey, Frank-  
ford, Philadelphia.

**Nuts, Bolts, &c., Makers of.**

Allentown Rolling Mills, Allentown.  
American Bolt Co., Lowell, Mass.  
Blake & Johnson, Waterbury, Conn.  
Port Chester Bolt and Nut Co., Port  
Chester, N. Y.  
Russell, Burdall & Ward, Port Chester.  
Shelton & Co., Birmingham, Conn.  
Sternbergh, J. H. & Son, Reading, Pa.  
Wilson, Fred., Worcester, Mass.  
Wm. H. Haskell Co., Pawtucket, R. I.

**Oil.**

Sun Oil Line Co., Toledo, Ohio.

**Oilers.**

Hammer & Co., Branford, Conn.  
Paine, Diehl & Co., Philadelphia.

**Oil Stones.**

Pike Mfg. Co., Pike Station, N. H.  
Chase, Geo., 107th & Harlem R., N. Y.

**Ox Shoes.**

Haven, Jas. L. Co., Cincinnati, O.  
Woodruff, Walter W. & Sons, Mt. Car-  
mel, Conn.

**Packing.**

Chalmers-Spence Co., 419 8th, N. Y.  
N. Y. Belting and Packing Co., N. Y.

**Padlocks.**

Ames Sword Co., Chicopee, Mass.  
Fram, E. T., Lancaster, Pa.

**Paint.**

Cleveland Iron Ore Paint Co., Cleve-  
land, O.

**Paint Burners.**

National Self-Heating Sad Iron Co., St.  
Louis, Mo.

**Patent Solicitors.**

Howson & Howson, Phila. & Wash'gton.  
Stocking, E. B., Washington, D. C.

**Perforated Metal.**

Harrington & King Perforating Co.,  
Chicago, Ill.

**Phosphor Bronze.**

Phosphor Bronze Smelting Co., Lim-  
ited, 512 Arch, Philadelphia.

**Pig Iron Warehouse.**

Phila. Warehouse Co., Phila., Pa.

**Pig Iron.**

Chamberlain, Wheeler & Co., Colum-  
bus, Ohio.

Hart, Wm. R. & Co., Philadelphia.  
Himrod, Chas. & Co., Chicago, Ill.  
Mann, Edwin R., Philadelphia, Pa.  
Montour Iron and Steel Co., Reading.  
Naylor & Co., 99 John, N. Y.

**Pipe, Bent.**

National Pipe Bending Co., New Haven.

**Pipe Cutters.**

Cox & Sons, Philadelphia, Pa.  
Curtis & Curtis, Bridgeport, Conn.  
Pancoast & Maule, Philadelphia.  
Saunders's Sons, D., Yonkers, N. Y.

**Pipe Grips.**

Prentiss Vise Co., 23 Dey, N. Y.

**Pipes, Fittings, &c., Makers of.**

McNab & Harlin Mfg. Co., N. Y.

**Pipe, Water and Gas, Makers of.**

Donahon Iron Co., Emaus, Pa.  
Fox, John, 160 Broadway, N. Y.  
Jackson & Woodin Mfg. Co., Berwick,  
Pa.

**Punching and Shearing Presses.**

E. W. Bliss Co., Brooklyn, N. Y.  
Cleveland Hdw. Co., Cleveland, Ohio.  
Crosby, O. A. & Co., Chicago, Ill.  
Ferracute Mch. Co., Bridgeton, N. J.  
Old Colony Rivet Co., Kingston, Mass.  
Stiles & Parker Press Co., Middletown Conn.  
Watson & Stillman, 204 E. 43d, N. Y.

**Radiators.**

Nason Mfg. Co., 71 Beekman, N. Y.

**Rails, Iron and Steel.**

Allentown Rolling Mills, Allentown, Cambria Steel-Cambria Iron Co., Johnstown, Pa.  
Montour Iron & Steel Co., Danville, Pennsylvania Steel Co., Steelton, Pa.  
Scranton Steel Co., Broadway, N. Y.  
Union Steel Co., Chicago, Ill.

**Railway and Machinists' Supplies.**

Hicks & Dickey, Philadelphia, Pa.  
Rogers, H. A. & Co., 19 John, N. Y.  
Walbaum, W. H., Philadelphia, Pa.

**Rat and Mouse Traps.**

F. F. Adams & Co., Erie, Pa.  
Estey, W. S., 71 Fulton, N. Y.  
Hotchkiss, E. S., Bridgeport, Conn.  
Ripley Mfg. Co., Unionville, Conn.

**Razors.**

Electric Cutlery Co., 91 Chambers, N. Y.  
J. R. Torrey Razor Co., Worcester, Mass.

**Refrigerators.**

Cordley & Hayes, 37 Barclay, N. Y.  
Grand Rapids Refrigerator Co., Grand Rapids, Mich.  
Stevens, B. A., Toledo, Ohio.

**Refrigerator Door Fasteners.**

Conroy, P. J. & Co., Philadelphia.

**Registers.**

Simonds Mfg. Co., 50 Cliff, N. Y.

**Reloading Tools.**

Ideal Mfg. Co., New Haven, Conn.

**Rivets.**

Disoway & Henderson, 165 Greenwich, N. Y.  
Old Colony Rivet Co., Kingston, Mass.  
Plymouth Mills, Plymouth, Mass.  
Townsend, W. F. & Co., New Brighton, Pa.

**Rivet Machines.**

Sweetser, Wm. A., Brockton, Mass.

**Rolling Mill Machinery.**

Birmingham Iron Fdry, Birmingham, Conn.  
Lloyd-Booth Co., Youngstown, O.  
Robinson-Rea Mfg. Co., Pittsburgh.  
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel.**

Garrison, A. & Co., Pittsburgh, Pa.  
Lloyd-Booth Co., Youngstown, Ohio.  
Seaman, Smith & Black, Pittsburgh.  
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

**Roofing.**

Cambridge Roofing Co., Cambridge, O.  
Canton Steel Roofing Co., Canton, O.

**Rope Snaps.**

Pratt & Letchworth, Buffalo, N. Y.

**Rules, Manufacturers of.**

Stanley Rule & Level Co., 29 Chambers, N. Y.

**Sad Irons.**

Colebrookdale Iron Co., Pottstown, Pa.

**Sash Balances.**

Caldwell, W. H., Rochester, N. Y.  
R. B. Huginn Mfg. Co., Hartford, Conn.  
Rochester Sash Bal. Co., Rochester, N. Y.

**Sash Cords and Chains.**

Bridgeport Chain Co., Bridgeport, Conn.  
Morton, Thos., 66 Elizabeth, N. Y.  
Smith & Egge, Mfg. Co., Bridgeport.

**Sash Cord Fasteners.**

Abbe, E. W., New Britain, Conn.  
Empire Portable Forge Co., Cohoes, N. Y.

**Sash Lifters.**

Van Wagoner & Williams Co., 82 Beekman, N. Y.

**Sash Locks.**

Champion Safety Lock Co., Cleveland, O.  
Claffen Mfg. Co., Cleveland, O.  
Clancy, J. R., Syracuse, N. Y.  
Ives, H. B. & Co., New Haven, Conn.  
Jennings, J. G., Oswego, N. Y.

**Sash Pulleys.**

Empire Portable Forge Co., Cohoes, N. Y.  
Eoore Mfg. & Fdry Co., Milwaukee, Wis.  
Rahner Hardware Mfg. Co., Troy, N. Y.

**Saws, Makers of.**

Adkins, E. C. & Co., Indianapolis, Ind.  
Bee & Johnson, Waterbury, Conn.  
Boston, Henry & Sons, Phila., Pa.  
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y.

**Saw Sets.**

Morrill, Chas., 79 Chambers, N. Y.

**Scales, Manufacturers of.**

Buffalo Scale Co., Buffalo, N. Y.  
Chatillon, John & Sons, 85-89 Cliff, N. Y.  
Forsyth Scale Co., Youngstown, O.  
Riehle Bros., Philadelphia.

**Screw Cutting Machinery.**

Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Screw Drivers.**

Brown, R. H. & Co., New Haven, Conn.  
Elrich Hdw. Mfg. Co., Plantsville, Conn.  
Sternbergh, J. H. & Son, Reading, Pa.

**Screw Plate and Pipe Cutter.**

Jarecki Mfg. Co., Erie, Pa.

**Screws, Makers of.**

Wm. H. Haskell Co., Pawtucket.  
Miles, F. S., 205 Quarry, Philadelphia.  
Worcester Machine Screw Co., Worcester, Mass.

**Scroll Saws.**

Seneca Falls Mfg. Co., Seneca Falls, N. Y.  
King, O'Connor & Co., Baltimore, Md.

**Scythe Stones and Whetstones.**

Pike Mfg. Co., Pike Stat'n, N. H.  
Cleveland Stone Co., Cleveland, O.  
Lake Huron Stone Co., Detroit and Chicago.

**Shafting, Makers of.**

Christiana Mch. Co., Christiana, Pa.  
Cresson, Geo. V., Philadelphia, Pa.  
Fitzsimons & Co., Cleveland, Ohio.  
Pierson & Co., 24-27 West, N. Y.  
Wood, Thos. & Co., Phila., Pa.

**Shears and Scissors.**

Acme Shear Co., Bridgeport, Conn.  
Henry Seymour Cutlery Co., N. Y.  
Schollhorn & Co., New Haven, Ct.

**Sheep Shears.**

Henry Seymour Cutlery Co., N. Y.

**Sheet Zinc.**

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Shovels, Spades and Scoops.**

Murray, Robt., 21 Duane, N. Y.

**Shutter Worker.**

Dodd Shutter Worker Co., 26 Church, N. Y.

**Sinks.**

Douglas, W. & B., Middletown, Conn.

**Smelting Works.**

Reeves, Paul S., 760 S. Broad, Phila.

**Speaking Tubes.**

Ostrander, W. R. & Co., N. Y.

**Spelter.**

Manning & Squier, 111 Liberty, N. Y.  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Spoons and Forks.**

Holmes & Edwards Silver Co., Bridgeport, Conn.  
Wallace, R. & Sons Mfg. Co., Wallingford, Conn.

**Sporting Goods.**

Hartley & Graham, 19 Malden Lane, N. Y.

**Spring Saws.**

Dunbar Bros., Bristol, Conn.  
Morgan Spring Co., Worcester, Mass.  
Sabin Machine Co., Montpelier, Vt.  
Titus & Babcock, Rochester, N. Y.

**Spring Hinges.**

Chicago Spring Butt Co., Chicago, Ill.  
Hart, Henry C. Mfg. Co., Detroit, Mich.  
Stearns & Co., E. C., Syracuse, N. Y.  
Stover Mfg. Co., Freeport, Ill.  
Union Mfg. Co., 103 Chambers, N. Y.

**Stamping Works.**

Nagara Stamping and Tool Co., Buffalo, N. Y.

**Steam Hammers, &c., Makers of.**

Dienelt & Eisenhardt, Philadelphia.  
Dudgeon, Richard, 24 Columbia, N. Y.  
Duncan, W. P. & Co., Bellefonte, Pa.

**Steel, Cold Rolled Strip.**

Willmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Steel Figures and Alphabets.**

Stutzman, J. M., 181 William, N. Y.

**Steel Importers.**

Abbott, Jere & Co., N. Y. and Boston.  
Hobson, Francis & Son, 97 John, N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.  
Lindsay, Jas. G. & Co., Philadelphia, Pa.

**Steel Manufacturers.**

Attna Iron & Steel Co., Bridgeport, O.  
Bellaire Nail Works, Bellaire, Ohio.  
Baker, C. F., 93 John, N. Y.  
Bookwalter Steel & Iron Co., 18 Cortlandt, N. Y.  
Buffalo Steel Foundry, Buffalo, N. Y.  
Carnegie, Phipps & Co., L'd., Pittsburgh, Pa.

**Steel (Mushet's Special).**

Jones, B. M. & Co., Boston.

**Steel Manufacturers.**

Attna Iron & Steel Co., Bridgeport, O.  
Bellaire Nail Works, Bellaire, Ohio.  
Baker, C. F., 93 John, N. Y.  
Bookwalter Steel & Iron Co., 18 Cortlandt, N. Y.  
Buffalo Steel Foundry, Buffalo, N. Y.  
Carnegie, Phipps & Co., L'd., Pittsburgh, Pa.

**Steel Castings Co., Phila.**

Chromie Steel Works, Brooklyn, N. Y.  
Frankford Steel Co., Philadelphia.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.

**Hicks & Dickey, Philadelphia, Pa.**

Horne, Wm. M. & Co., Boston, Mass.  
Ingalls, Joshua S. & Co., Troy, Ohio.  
Jesseop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.

**Jones, B. M. & Co., Boston, Mass.**

Kayser, Ellison & Co., Sheffield, Eng.  
Midvale Steel Co., Nicetown, Phila.  
Miller, Metcalf & Parkin, Pittsburgh.  
Moorehead-McCleane Co., Pittsburgh, Pa.

**Moss, F. W., 83 John, N. Y.**

Naylor & Co., 99 John, N. Y.  
Pennsylvania Steel Co., Steelton, Pa.  
Pottstown Iron Co., Pottstown, Pa.  
Pottsville Iron and Steel Co., Pottsville, Pa.

**Rowland, Wm. & Harvey, Frankford, Philadelphia.**

Singer, Nimick & Co., Pittsburgh.  
Smith Bros. & Co., Pittsburgh, Pa.  
Standard Steel Works, Philadelphia.  
Troy Steel and Iron Co., Troy, N. Y.  
Wardlaw, S. & C., Sheffield, Eng.

**Wetherell Bros., 115 Liberty, N. Y.**

Willmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Steel, Manufacturers' Agents.**

Gautier, D. G. & Co., 114 John, N. Y.  
Hicks & Dickey, Philadelphia, Pa.  
Horne, Wm. M. & Co., Boston, Mass.

**Steel Nails.**

Bellaire Nail Works, Bellaire, Ohio.

**Steel, Sheet.**

Attna Iron & Steel Co., Bridgeport, O.  
Standard Iron Co., Bridgeport, Ohio.

**Steel Spiral Springs, Manufacturers.**

Cary & Moen, 234 W. 29th, N. Y.  
Chatillon, John & Sons, N. Y.  
Roland, Wm. & Harvey, Frankford.

**Steel, Tool.**

Frankford Steel Co., Philadelphia.  
Jesseop, Wm. & Sons, Sheffield, Eng. and 91 John, N. Y.  
Leng, John S., 4 Fletcher, N. Y.  
Smith Bros. & Co., Pittsburgh, Pa.

**Stocks and Dies.**

Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Saunders' Sons, D., Yonkers, N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Stove Linings.**

Ostrander, Jas. & Son, Troy, N. Y.

**Stoves, Oil, Vapor and Gasoline.**

American Oil Stove Co., Gardner, Mass.  
Standard Lighting Co., Cleveland, O.

**Strap Hinges.**

Mann, Jas. & Sons, Buffalo, N. Y.

**Strops.**

Electric Cutlery Co., 91 Chambers, N. Y.  
J. R. Torrey & Co., Worcester, Mass.

**Sulphuric Acid.**

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Swaging Machines.**

Excelsior Needle Co., Torrington.

**Tack and Nail Machinery.**

Sweetser, W. A., Brockton, Mass.

**Tacks, Brads, Staples, &c.**

A. Field & Sons, Taunton, Mass.  
American Tack Co., Fairhaven, Mass.  
Disoway & Henderson, 165 Greenwich, N. Y.  
Dunbar, Hobart & Co., 39 Warren, N. Y.  
Florence Tack Co., Florence, Mass.  
Phillips, F. & Sons, South Hanover.  
Plymouth Mills, Plymouth, Mass.  
Trufant, W. E., Whitman, Mass.

**Taps and Dies.**

Butterfield & Co., Derby Line, Vt.  
Manning, Maxwell & Moore, 111 Liberty, N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Tempering Solution.**

Bear, Lewis U. & Co., Philadelphia, Pa.

**Testing Machines.**

Riehle Bros., Philadelphia.

**Thill Springs.**

Butts & Ordway, Boston, Mass.

**Toe Calks, Steel.**

Burke, P. F., Boston, Mass.

**Tools.**

Am. Bit Brace Co., Buffalo, N. Y.  
Atkins, E. C. & Co., Indianapolis, Ind.  
Bridgeport Steel Cutting Co., Bridgeport, Conn.  
Britton, J. & Son, Stoughton, Mass.  
Brown, R. H. & Co., New Haven, Conn.  
Elrich Hdw. Mfg. Co., Plantsville, Conn.  
Humphrey Tool Co., Warren, Mass.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers, N. Y.  
Starrett, L. S., Athol, Mass.

**Tool Chests.**

Am. Tool Co., 200 W. Houston St., N. Y.

**Tools and Machines (Turners').**

Niagara Stamping and Tool Co., Buffalo, N. Y.

**Tools, Steam and Gas Fitters'.**

Curtis & Curtis, Bridgeport, Conn.  
Saunders' Sons, D., Yonkers, N. Y.

**Transom Litters.**

Wollensak, J. F., Chicago, Ill.

**Trucks, Manufacturers of.**

Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.  
Riehle Bros., 9th St., Phila.

**Tube Scrapers.**

Chalmers-Spence Co., 419 8th, N. Y.

**Tubes, Seamless Drawn Copper.**

Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Bridgeport Brass Co., 19 Mur'y, N. Y.  
Randolph & Clowes, Waterbury, Conn.

**Tubes, Steel.**

Horton Mfg. Co., Bristol, Conn.  
Leng, John S., 4 Fletcher, N. Y.  
Spiral Weld Tube Co., 5 & 7 Beekman St., New York.

**Tumbling Barrels.**

Henderson Bros., Waterbury, Conn.

**Turnbuckles.**

Cleveland City Forge and Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E. D.

**Twist Drills, Makers of.**

Cleveland Twist Drill Co., Cleveland.  
Morse Twist Drill & Machine Co., New Bedford, Mass.  
Standard Tool Co., Cleveland.

**Typewriters.**

Pope Mfg. Co., Boston, Mass.

**Valves, Gas, Water and Steam.**

Chapman Valve Mfg. Co., Boston.  
Jenkins Bros., 71 John, N. Y.  
Leng, John S., 4 Fletcher, N. Y.  
McNab & Harlin Mfg. Co., 55 John N. Y.

**Vices.**

Howard Iron Works, Buffalo, N. Y.  
Prentiss Vise Co., 23 Dey, N. Y.

**Vulcanized Fibre.**

McNab & Harlin Mfg. Co., 14 Dey St., N. Y.

**Wagon Jacks.**

Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.  
Covert, E. Mfg. Co., Farmer Village, N. Y.

**Warehouse, Pig Iron.**

Phila. Warehouse Co., Phila., Pa.

**Washers.**

Honhorst, Littleford & Co., Cincinnati.  
Lanman, E. B., Columbus, O.  
Lebanon Rolling Mills, Lebanon, Pa.  
Mason Iron Co., Philadelphia, Pa.  
National Lock Washer Co., Newark, N. J.

**Water Coolers and Filters.**

Cordley & Hayes, 37 Barclay St., N. Y.

**Water Motors.**

Bonham Hydraulic Motor Co., Providence, R. I.

**Well Machinery.**

American Well Works, Peoria, Ill.  
Austin, F. C. Mfg. Co., Chicago, Ill.  
St. Louis Vise & Tool Co., St. Louis, Mo.

**Wheelbarrows.**

Pugsley & Chapman, 8 Liberty, N. Y.

**Wheels.**

Quincy Metal Wheel Co., Quincy, Ill.

**Whiffletree Hooks.**

Heads Iron Foundry, Utica, N. Y.

**White Lead.**

Atlantic White Lead and Linseed Oil Co., 287 Pearl, N. Y.  
Lewis, John T. & Bros. Co., Phila.

**Window Cord, Makers of.**

Samsom Cordage Works, Boston, Mass.

**Window Screens.**

Queen Anne Screen Co., Burlington, Vt.  
Stearns & Co., E. C., Syracuse, N. Y.

**Wire, Manufacturers of.**

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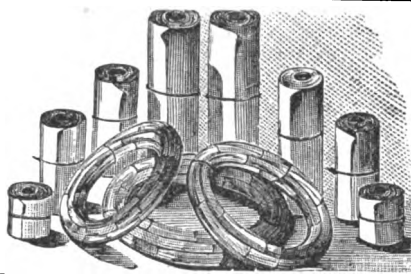
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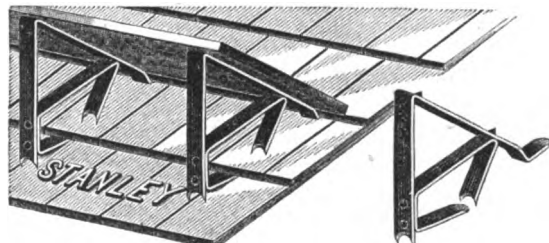
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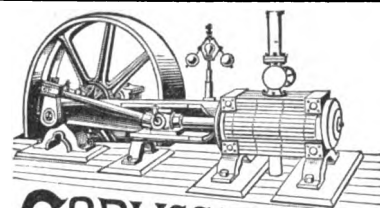
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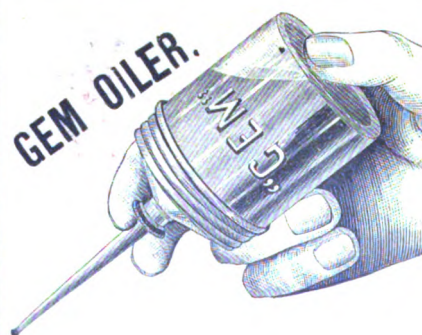
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